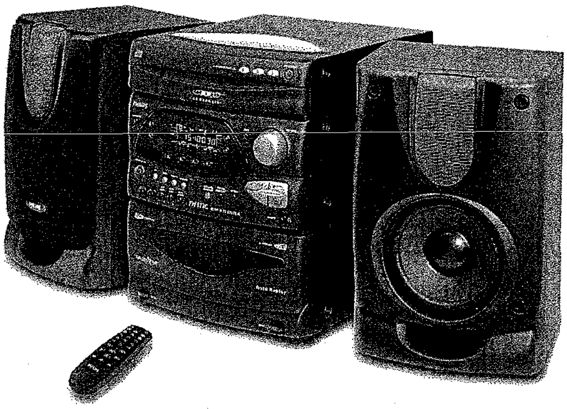
Mini System FW373C/21/21M/22/22B/25

Service
Service
Service

PHIL-05172



Service Manual

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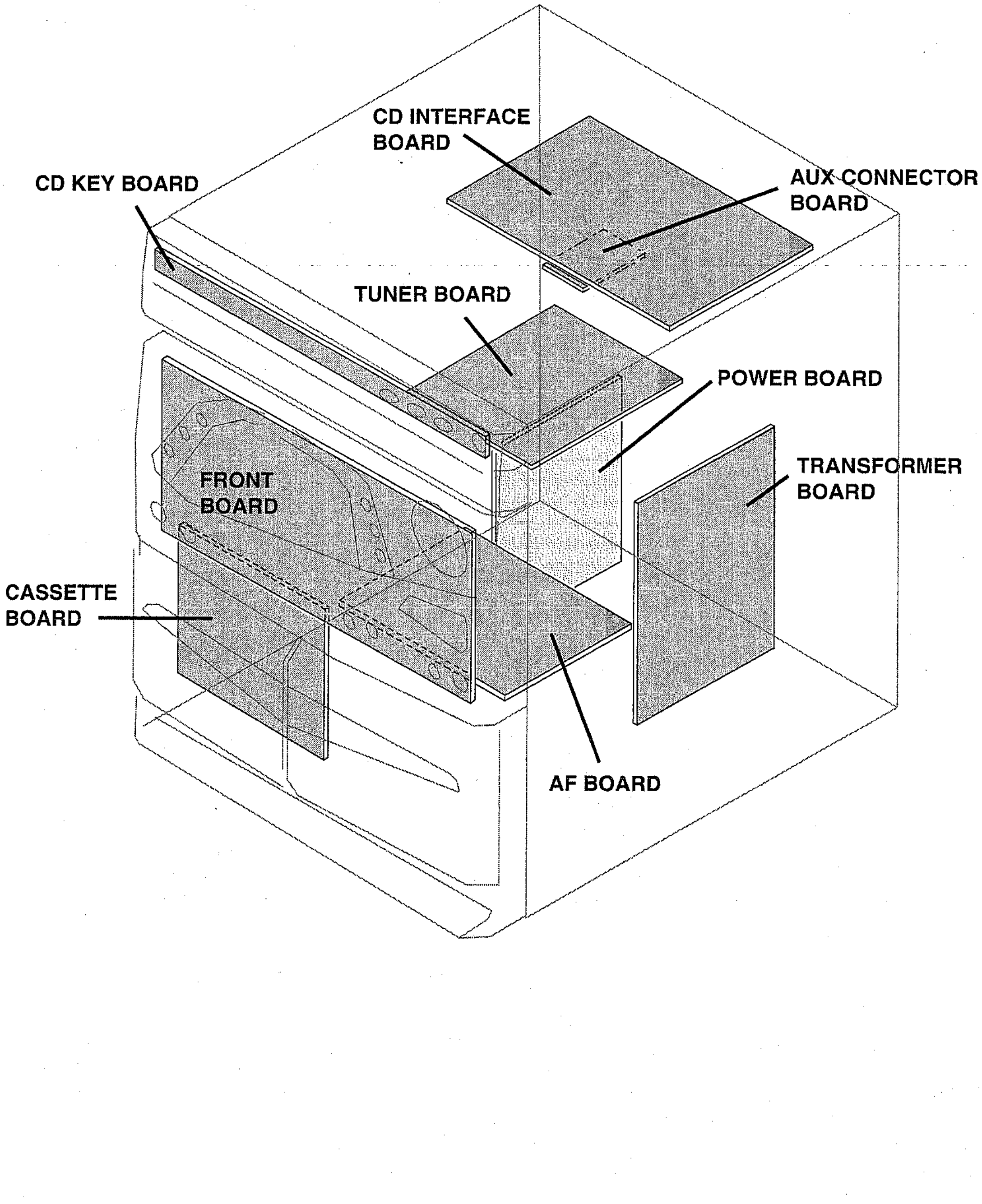
PCS 96 597

PHILIPS

5172

LOCATION OF PRINTED CIRCUIT BOARD


CD INTERFACE BOARD
CD KEY BOARD
AUX CONNECTOR BOARD
TUNER BOARD
POWER BOARD
FRONT BOARD
TRANSFORMER BOARD
CASSETTE BOARD
AF BOARD

GENERAL:

Mains voltage : 120V -/37
120 - 230V -/21/21M
230V -/25/34
220-230V -/22
240V -/30
Mains frequency : 50 ~ 60Hz
Power consumption : 37W max. @1/8 Prated

Amplifier:

Output power : 2 x 18W at 3Ω
Headphone : 3.5mm stereo jack
Frequency response : 40Hz - 20kHz (-3dB) Limit

Input sensitivity
Aux/Line : 400mV ±2dB
Microphone : 2.5mV ±2dB @ 1kHz

Equalizer:
100Hz : -3.5 ~ 5dB
1 KHz : ± 3dB
12kHz : -0.5 ~ 5dB

TUNER:

FM
Tuning range : 87.5MHz-108MHz
Grid : 100kHz
50kHz -/37
IF : 10.7MHz
Aerial input : 300Ω Click fit for /37
Sensitivity Mono 26dB S/N : < 7µV
Distortion at RF=1mV,
Freq. dev. =75kHz : 3% - typ. 2% {1% -typ. 2%}

IF rejection : > 60dB
Image rejection : > 25dB
-3dB Limiting Point : <23.5dBf {22dBf}

MW
Tuning range : 530kHz - 1710kHz -/37
{531 - 1602kHz}
531kHz - 1062kHz
Grid : 10kHz -/37
9kHz
IF : 450kHz ± 1kHz
Sensitivity at 26dB S/N : < 4.0mV/M
Distortion at RF=50mV,
m=80%) : < 5% -typ. 3% {3% - typ. 7%}

IF rejection : > 45dB
Image rejection : > 28dB

LW
Tuning range : 153kHz-279kHz
Sensitivity at 26dB S/N : < 6.0mV/M
IF rejection : > 26dB
Image rejection : > 28dB {35dB}

CD Unit:

Frequency response within : 20Hz - 20kHz at ±3dB
Signal/Noise ratio : > 80dB (A-weighted)
Distortion at 1kHz : < 0.5%
Channel unbalance : < 1dB
Channel crosstalk at 1kHz : > 50dB
De-emphasis : 0 or 15/50 µS

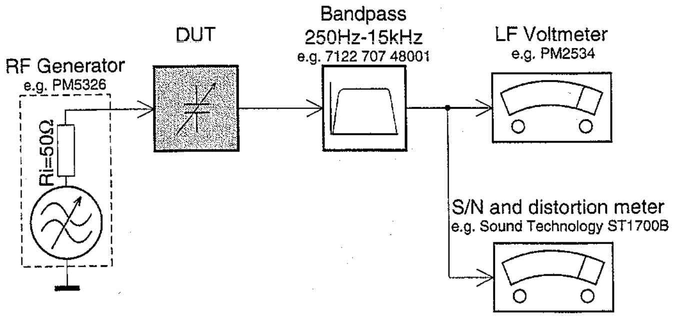
Recorder Part:
Tape speed : 4.76 cm/sec ±2%
Wow and flutter : < 0.4%
Fast-wind time C60 : 130 sec
Bias system AM/FM : AC 75kHz ± 5kHz
Distortion at 250nWb/m : < 5%
Channel difference at PB : < 3dB
Channel difference overall : < 3dB
Channel Separation : > 24dB at 1kHz
Track Separation : > 55dB at 1kHz
ALC attack time : < 10ms
ALC recovery time : > 60s
Frequency Response : 80Hz - 12.5kHz within - 8dB
Signal to noise ratio 1 : > 44dB
Signal to Hiss ratio 2 : > 48dB
Erase attenuation 3 : > 55dB at 1kHz

1 at 250 nW/m FF-weighted (22Hz-22kHz band pass filter)
2 at 250 nW/m A-weighted
3 use a 1kHz passfilter to minimize the wide band noise component

Note: {....} for version 22 only

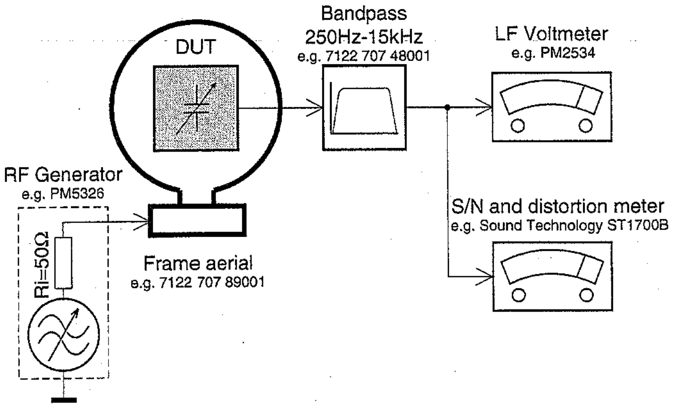
MEASUREMENT SETUP

Tuner FM


RF Generator
e.g. PM5326
Ri=50Ω
DUT
Bandpass
250Hz-15kHz
e.g. 7122 707 48001
LF Voltmeter
e.g. PM2534
S/N and distortion meter
e.g. Sound Technology ST1700B

Use a bandpass filter to eliminate hum (50Hz, 100Hz) and disturbance from the pilottone (19kHz, 38kHz).

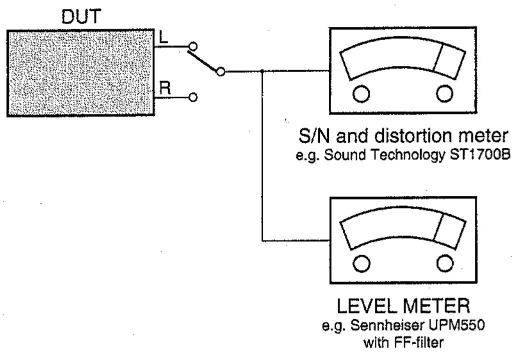
Tuner AM (MW,LW)


DUT
Bandpass
250Hz-15kHz
e.g. 7122 707 48001
LF Voltmeter
e.g. PM2534
RF Generator
e.g. PM5326
Ri=50Ω
Frame aerial
e.g. 7122 707 89001
S/N and distortion meter
e.g. Sound Technology ST1700B

To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday´s cage.
Use a bandpass filter (or at least a high pass filter with 250Hz) to eliminate hum (50Hz, 100Hz).

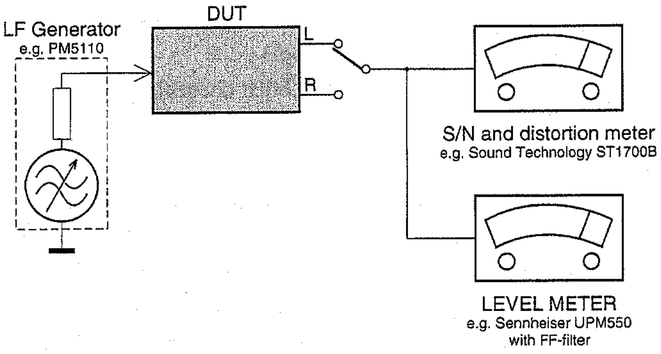
CD

Use Audio Signal Disc SBC429 4822 397 30184
(replaces test disc 3)


DUT
L
R
S/N and distortion meter
e.g. Sound Technology ST1700B
LEVEL METER
e.g. Sennheiser UPM550
with FF-filter

Recorder

Use Universal Test Cassette **CrO2** SBC419 4822 397 30069
or Universal Test Cassette **Fe** SBC420 4822 397 30071


LF Generator
e.g. PM5110
DUT
L
R
S/N and distortion meter
e.g. Sound Technology ST1700B
LEVEL METER
e.g. Sennheiser UPM550
with FF-filter

SERVICE AIDS

Service Tools:

Universal Torx driver holder	4822 395 91019
Torx bit T10 150mm	4822 395 50456
Torx driver set T6 - T20	4822 395 50145
Torx driver T10 extended	4822 395 50423

Cassette:

SBC419 Test cassette CrO2	4822 397 30069
SBC420 Test cassette Fe	4822 397 30071
MTT150 Dolby level 200nWb/M	4822 397 30271

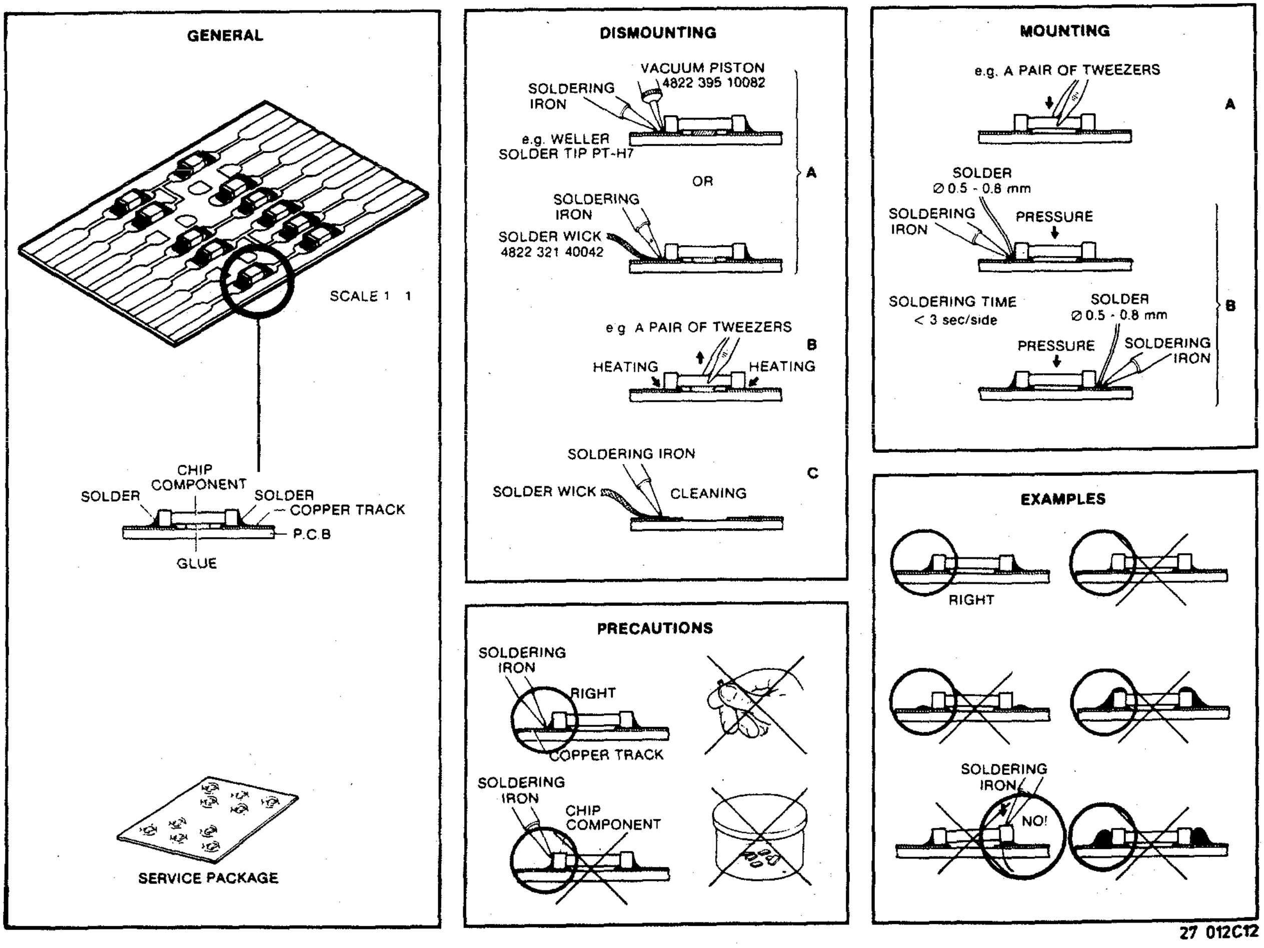
Compact Disc:

SBC426/426A Test disc 5 + 5A	4822 397 30096
SBC442 Audio Burn-in Test disc 1kHz	4822 397 30155
SBC429 Audio Signals disc	4822 397 30184
Dolby Pro-logic Test Disc	4822 395 10216

ESD Equipment:

Anti-static table mat - large 1200x650x1.25mm	4822 466 10953
Anti-static table mat - small 600x650x1.25mm	4822 466 10958
Anti-static wristband	4822 395 10223
Connector box (1MΩ)	4822 320 11307
Extension cable (to connect wristband to conn. box)	4822 320 11305
Connecting cable (to connect table mat to conn. box)	4822 320 11306
Earth cable (to connect product to mat or box)	4822 320 11308
Complete kit ESD3 (combining all above products)	4822 320 10671
Wristband tester	4822 344 13999

HANDLING CHIP COMPONENTS


GENERAL
SCALE 1 : 1
CHIP COMPONENT
SOLDER
SOLDER
COPPER TRACK
P.C.B
GLUE
SERVICE PACKAGE
DISMOUNTING
VACUUM PISTON 4822 395 10082
SOLDERING IRON
e.g. WELLER SOLDER TIP PT-H7
OR
SOLDERING IRON
SOLDER WICK 4822 321 40042
A
e.g. A PAIR OF TWEEZERS
B
HEATING
HEATING
SOLDERING IRON
SOLDER WICK
CLEANING
C
MOUNTING
e.g. A PAIR OF TWEEZERS
A
SOLDER Ø 0.5 - 0.8 mm
SOLDERING IRON
PRESSURE
SOLDERING TIME < 3 sec/side
SOLDER Ø 0.5 - 0.8 mm
PRESSURE
SOLDERING IRON
B
PRECAUTIONS
SOLDERING IRON
RIGHT
COPPER TRACK
SOLDERING IRON
CHIP COMPONENT
EXAMPLES
RIGHT
SOLDERING IRON
NO!
27 012C12

ESD

(GB) WARNING

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD).
Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance.
Keep components and tools also at this potential.

(NL) WAARSCHUWING

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen.
Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

(F) ATTENTION

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).
Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.
Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfiler le bracelet serti d'une résistance de sécurité.
Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

(D) WARNUNG

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).
Unsorgfältige Behandlung im Reparaturfall kan die Lebensdauer drastisch reduzieren.
Veranlassen Sie, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand verbunden sind mit dem gleichen Potential wie die Masse des Gerätes.
Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

(I) AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione.
Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

(GB)

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified, be used.

(NL)

Veiligheidsbepalingen vereisen, dat het apparaat bij reparatie in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde, worden toegepast.

(F)

Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utiliséés les piéces de rechange identiques à celles spécifiées.

(D)

Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Original zustand des Geräts darf nicht verändert werden; für Reparaturen sind Original-Ersatzteile zu verwenden.

(I)

Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati i pezzi di ricambio identici a quelli specificati.

"After servicing and before returning set to customer perform a leakage current measurement test from all exposed metal parts to earth ground to assure no shock hazard exist. The leakage current must not exceed 0.5mA."

"Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agréés, seuls habilités à réparer votre appareil en panne".

CLASS 1
LASER PRODUCT
3122 110 03420

(GB) Warning !

Invisible laser radiation when open.
Avoid direct exposure to beam.

(S) Varning !

Osynlig laserstrålning när apparaten är öppnad och spärren är urkopplad. Betrakta ej strålen.

(SF) Varoitus !

Avatussa laitteessa ja suojalukituksen ohitettaessa olet alttiina näkymättömälle laserisäteilylle. Älä katso säteeseen!

(DK) Advarse !

Usynlig laserstråling ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsaettelse for stråling.

General Information **4**
Safety Information **4**
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Tuner **10-11**
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Karaoke **14**
CD Changer **15-17**
Clock Setting **18**
Timer Setting **18**
Maintenance **19**
Specifications **19**
Troubleshooting Guide **20-21**

General Information

- The typeplate (which contains the serial number) is located at the rear of the set.
- Recording is permissible if copyright or other rights of third parties are not infringed.

1 All unnecessary packaging material has been omitted. We have tried to make the packaging easy to separate into three mono-materials:
  - cardboard (box)
  - expandable polystyrene (buffer)
  - polyethylene (bags, protective foam sheet).

  Please observe the local regulations regarding the disposal of these packaging materials.

2 Your set consists of materials which can be recycled and reused if disassembled by a specialized company. Please follow local regulations on recycling your old set.

3 Do not dispose of dead batteries with your household waste. Dispose of batteries according to local regulations.

4 Note: Switching off the standby mode overnight (remove the AC power cord from the wall socket) will save energy.

Accessories (Supplied)

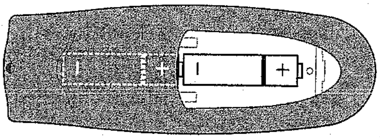
- Remote control
- Batteries (2 x AAA) for remote control
- AM loop antenna
- FM antenna wire
- AC power cord

Safety Information

- Before operating the system, check that the operating voltage indicated on the typeplate (or the voltage indication beside the voltage selector) of your system is identical with the voltage of your local power supply. If not, please consult your dealer. The type plate is located at the rear of your system.
- When the system is switched on, do not move it around.
- Place the system on a solid base (e.g. a cabinet).
- Place the system in a location with adequate ventilation to prevent internal heat build-up in your system.
- Do not expose the system to excessive moisture, rain, sand or heat sources.
- Under no circumstances should you repair the unit yourself, as this will invalidate the warranty!
- If the system is brought directly from a cold to a warm location, or is placed in a very damp room, moisture may condense on the lens of the CD unit inside the system. Should this occur, the CD player will not operate normally. Leave the power on for about one hour with no disc in the unit until normal playback is possible.
- Electrostatic discharge may cause unexpected problems. See whether these problems disappear if you unplug the AC power cord and plug it in again after a few seconds.
- **To disconnect the system from the power supply completely, remove the AC power plug from the wall socket.**

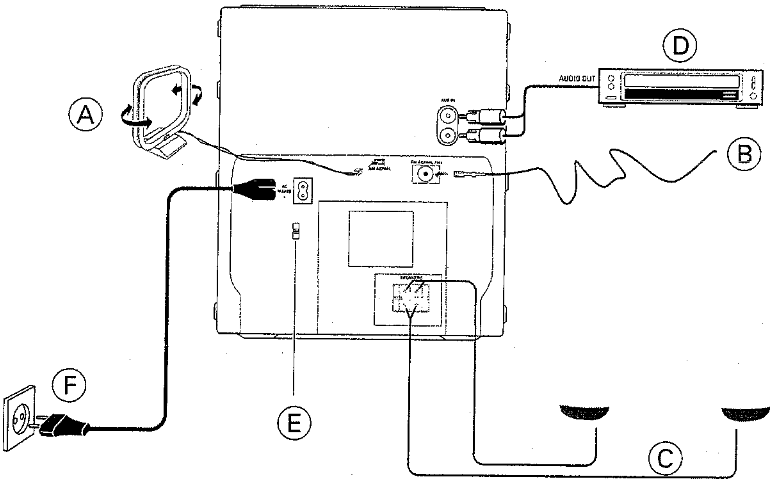
Inserting the batteries into the remote control

- Insert the batteries (Type R03 or AAA) into the remote control as shown inside the battery compartment.



- To avoid damage from possible battery leakage, remove dead batteries or batteries that will not be used for a long time. For replacement use type R03 or AAA batteries.

Rear Connection



Ⓐ AM Antenna Connection

Connect the supplied loop antenna to the AM AERIAL terminal. Adjust the position of the AM loop antenna for the best reception.

Ⓑ FM Wire Antenna Connection

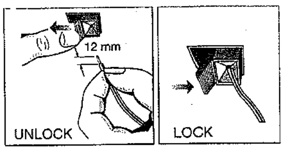
Connect the supplied FM wire antenna to the FM 75 Ω terminal. Adjust the position of the FM antenna for the best reception.

Outdoor Antenna
For better FM stereo reception connect an outdoor FM antenna to the FM AERIAL 75 Ω terminal using a 75 Ω coaxial wire.

PREPARATIONS

Ⓒ Speaker Connections

- Connect the right speaker to terminal **R**, with the red wire to + and the black wire to −.
- Connect the left speaker to terminal **L**, with the red wire to + and the black wire to −.
- Clip the stripped portion of the speaker wire as shown.


12 mm
UNLOCK
LOCK

Ⓓ Connecting other equipment to your system

You can connect the TV, Laser Disc or VCR audio left and right output terminals to the AUX IN terminal at the rear of the system.

Ⓔ Adjusting the Operating Voltage

(for specific versions only)

Before connecting the AC power cord to a wall outlet, make sure that the voltage selector at the rear of the system is set to the local power line voltage. If not, reset the selector before connecting to the wall outlet.

Ⓕ AC Power Supply

After all other connections have been made, connect the AC power cord to the set and to the wall outlet.

REMOTE CONTROL

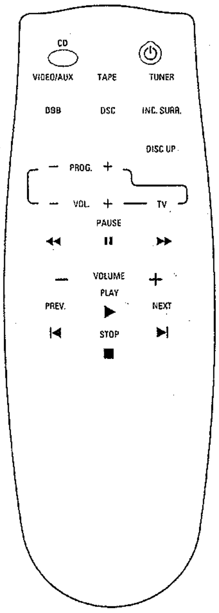
Remote Control Functions

- First select the source you wish to control by pressing one of the source selection keys on the remote control (e.g. CD, TUNER, TAPE or VIDEO/AUX).
- Then select the desired function (PLAY, NEXT, etc.).

Notes:

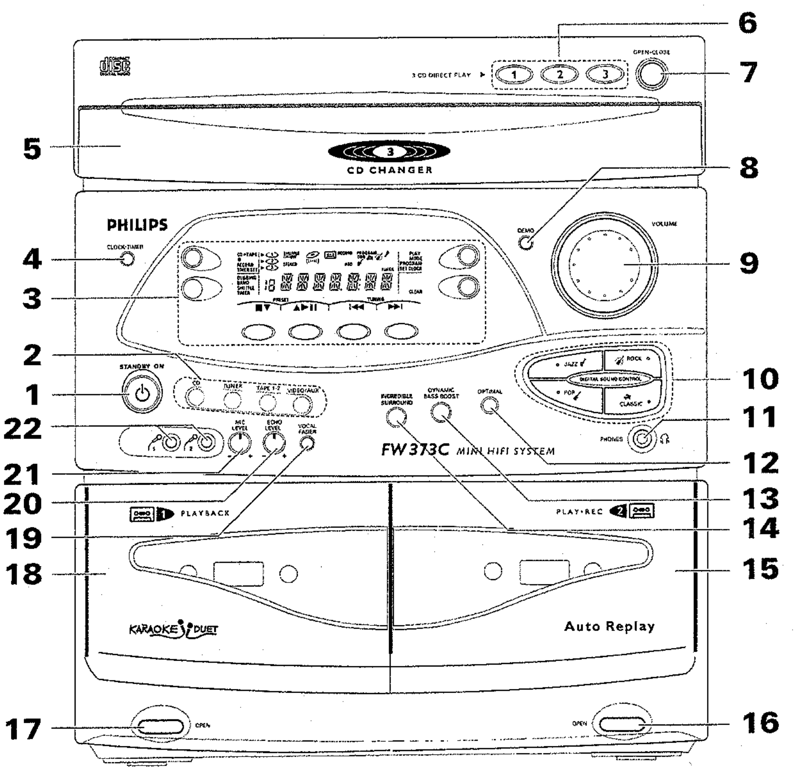
- *Whenever a remote control button is pressed, the source icon on the set display will flicker. This indicates the remote control signal is received by the set.*
- *For TV/VCR operation, the accessory TV or VCR must use the RC-5 code remote control system.*

⏻	to switch the unit to standby mode.
CD	to select CD mode.
VIDEO/AUX	to select VIDEO/AUX or external mode.
TAPE	to select TAPE 1/2 mode.
TUNER	to select TUNER mode.
INCR. SURR.	to switch on or off the Incredible Surround sound effect.
DSC	to select digital sound control: JAZZ, ROCK, CLASSIC, POP or OPTIMAL.
DBB	to switch on and off dynamic bass boost.
DISC UP	to select the next disc tray for playback.
PROG. +/−	to select previous/next channel for TV/VCR.
VOL. +/−	to adjust the TV volume.
TV	to select TV mode.
PAUSE ❚❚	to interrupt playback in CD or Tape mode.
◀◀ / ▶▶	
for TUNER	to select a lower/higher frequency.
for CD	to search for a particular passage.
for Tape	to fast forward/rewind the cassette.
VOLUME +/−	to adjust the volume of the system.
PLAY ▶	to start playback in CD or Tape mode.
STOP ■	to stop playback in CD or Tape mode.
⏮ PREV. / NEXT ⏭	
for TUNER	to select a lower/higher tuner preset station.
for CD	to select previous/next CD track.


CD
VIDEO/AUX
TAPE
TUNER
DBB
DSC
INC. SURR.
DISC UP
PROG.
VOL.
TV
PAUSE
VOLUME
PLAY
PREV.
NEXT
STOP

CONTROLS

Front View


1
2
3
4
5
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7
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10
11
12
13
14
15
16
17
18
19
20
21
22
3 CD DIRECT PLAY
OPEN•CLOSE
CD CHANGER
PHILIPS
CLOCK•TIMER
DEMO
VOLUME
STANDBY ON
TUNER
TAPE 1/2
VIDEO/AUX
MIC LEVEL
ECHO LEVEL
VOCAL FADER
INCREDIBLE SURROUND
DYNAMIC BASS BOOST
OPTIMAL
JAZZ
ROCK
POP
CLASSIC
DIGITAL SOUND CONTROL
PHONES
FW373C MINI HIFI SYSTEM
PLAYBACK
PLAY•REC
KARAOKE DUET
Auto Replay
OPEN

1 **STANDBY-ON**
- to switch the set on or to standby mode.

2 **SOURCE SELECTION**
- to select the following:
  - **TUNER** : to switch to Tuner mode.
  - **CD** : to switch to CD mode.
  - **TAPE 1-2** : to switch to Tape 1 or 2 mode.
  - **VIDEO/AUX**: to switch to VIDEO/AUX mode (for external sources, e.g. TV, Laser Disc or VCR sound).

3 **MAGIC MENU USER INTERFACE AND DISPLAY**
- to select the respective control functions.

4 **CLOCK•TIMER**
- to set the clock or timer.

5 **CD CAROUSEL TRAY**

6 **3 CD DIRECT PLAY**
- to select play for each CD tray.

7 **OPEN•CLOSE**
- to open or close the CD carousel tray.

8 **DEMO**
- to display the various features offered by the system.

9 **VOLUME**
- to adjust the volume level.

10 **DIGITAL SOUND CONTROL (DSC)**
- to select the desired sound effect: JAZZ, ROCK, CLASSIC or POP.

11 **PHONES 🎧**
- to connect headphones jack.

12 **OPTIMAL**
- to select the sound setting that is tuned to the acoustics of the supplied speakers.

13 **DYNAMIC BASS BOOST (DBB)**
- to switch on bass boost to enhance bass response or to switch off bass boost.

14 **INCREDIBLE SURROUND**
- to switch on or off the Incredible Surround sound effect.

15 **TAPE DECK 2**
16 **OPEN**
  – to open TAPE DECK 2 cassette compartment.
17 **OPEN**
  – to open TAPE DECK 1 cassette compartment.
18 **TAPE DECK 1**
19 **VOCAL FADER** *(for specific versions only)*
  – to fade out the vocal of the original song.
20 **ECHO LEVEL** *(for specific versions only)*
  – to adjust the echo level for karaoke or microphone recording.
21 **MIC LEVEL** *(for specific versions only)*
  – to adjust the mixing level for karaoke or microphone recording.
22 **MIC 1 and 2** *(for specific versions only)*
  – to connect microphones jack.

Demo mode

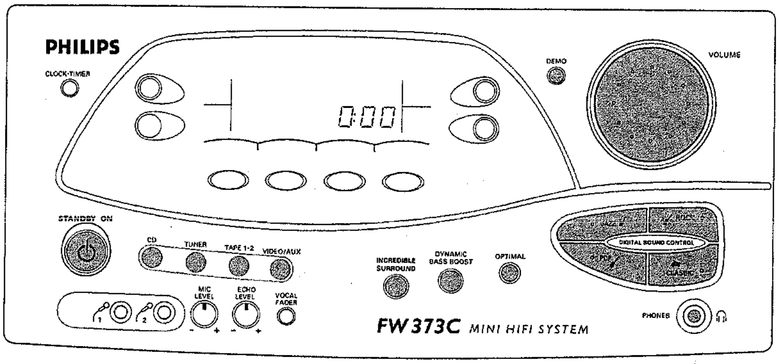
The system has a demonstration mode that shows the various features offered by the system. Whenever the system is connected to an AC power source, the demonstration mode will start automatically.

To stop demonstration mode

- Press **DEMO**, **STANDBY - ON**, **CD**, **TUNER**, **TAPE 1-2**, **VIDEO/AUX**, CD **OPEN•CLOSE** or **3 CD DIRECT PLAY**button on the system (or ⏻, **CD**, **TUNER**, **TAPE** or **VIDEO/AUX** on the remote control) to stop the demonstration.

To switch on demonstration mode

- Press **DEMO**.
  → The display will show "WELCOME TO THE AUDIO WORLD", then a demonstration of the various features will follow.



Important:
Before you begin operating the system, complete the preparation procedures.

Switching the system ON

- Press **STANDBY-ON**, **CD**, **TUNER**, **TAPE 1-2** or **VIDEO/AUX** (or **CD**, **TUNER**, **TAPE** or **VIDEO/AUX** on the remote control).

Switching the system to standby mode

- Press **STANDBY-ON** again (or ⏻ on the remote control).

Selecting the Sound Source

- Press the respective source button: **CD**, **TUNER**, **TAPE 1-2** or **VIDEO/AUX** (or **CD**, **TUNER**, **TAPE** or **VIDEO/AUX** on the remote control).
  → The display indicates the selected sound source.

Note:
For an external sound source, make sure that you have connected the audio left and right output terminals of the external equipment (TV, VCR or Laser Disc player) to the AUX IN terminals at the rear of the set.

Volume Adjustment

Turn **VOLUME** right or left (or press **VOLUME** + or – on the remote control) to increase or decrease the sound level.

For Personal Listening
Connect the headphones to the PHONES 🎧 socket. The speakers will be muted.

Digital Sound Control (DSC)

- To enjoy a special sound effect, press **JAZZ** (🎷), **ROCK** (🎸), **CLASSIC** (🎹) or **POP** (🎸).
- You can also press **DSC** on the remote control to select the respective sound setting, including **OPTIMAL**.

Optimal Sound

- Press **OPTIMAL** to hear the sound setting that is tuned to the acoustics of the supplied speakers.

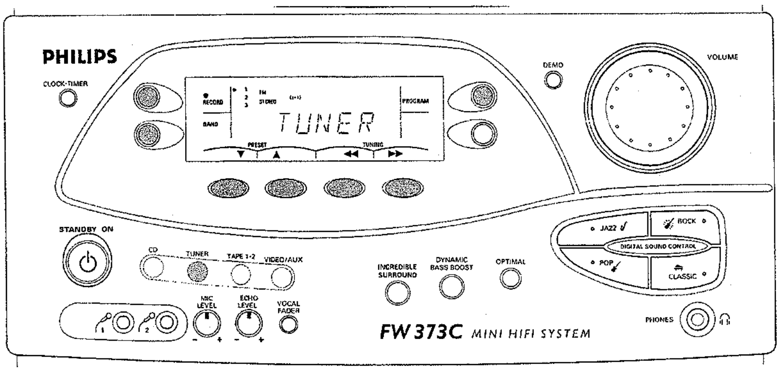
Dynamic Bass Boost (DBB)

- Press **DBB** on the set or remote control to enhance the bass response.
  → The DBB flag lights up.

Incredible Surround

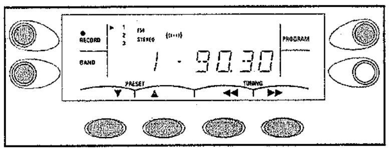
INCREDIBLE SURROUND

- In additional to all other sound settings, you can switch on or off the incredible surround sound feature by pressing **INCREDIBLE SURROUND**.
  → This creates a phenomenal surround sound effect even if the speakers are positioned close to the system. The sound becomes "incredibly" spatial.
  → The INCREDIBLE SURROUND button lights up.


PHILIPS
CLOCK-TIMER
TUNER
DEMO
VOLUME
STANDBY ON
CD
TUNER
TAPE 1-2
VIDEO/AUX
INCREDIBLE SURROUND
DYNAMIC BASS BOOST
OPTIMAL
JAZZ
ROCK
DIGITAL SOUND CONTROL
POP
CLASSIC
MIC LEVEL
ECHO LEVEL
VOCAL FADER
PHONES
FW373C MINI HIFI SYSTEM

Tuning to radio stations

1. Press **TUNER** on the unit or on the remote control to select TUNER mode.
   - → First 'TUNER' appears on the display and after a few seconds it will show the current frequency.
     The available display button functions light up:


RECORD
STEREO
FM
PROGRAM
BAND
1 - 90.30
PRESET
TUNING

2. Press BAND to select the desired waveband : FM or MW.
3. Press TUNING ◀◀ or ▶▶ for more than one second and release.
   - → The display will show 'SEARCH' until a station with sufficient signal strength is found.

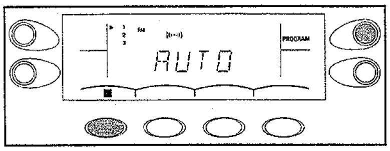
- Repeat this procedure until the desired station is reached.
- To tune to a weak station, briefly press TUNING ◀◀ or ▶▶ until the display shows the right frequency and/or when the best reception has been obtained.

Note:
If you briefly press TUNING ◀◀ or ▶▶ (◀◀ or ▶▶ on the remote control), the frequency changes step by step.

Storing Preset Stations

You can store up to 20 stations in the memory. When a preset station is selected, the preset number appears next to the frequency on the display.

Automatic programming

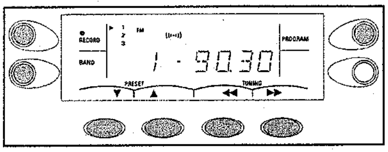

FM
PROGRAM
AUTO

1. Press **TUNER** on the unit or on the remote control.
2. Press PROGRAM for more than one second.
   - → PROGRAM flashes and 'AUTO' is displayed.
   - → Every available station will be stored automatically. The frequency and preset number will be displayed briefly.
   - → It will stop searching when all the available stations are stored or the memory for 20 preset stations is used.
   - → The set will remain tuned to the last stored preset number.

- You can cancel the automatic programming by pressing PROGRAM or ■.

Note:
If you want to reserve a section of preset numbers, for example preset number 1 to 9, select preset 10 before starting automatic programming: now only the preset numbers 10 to 20 will be programmed.

Manual programming

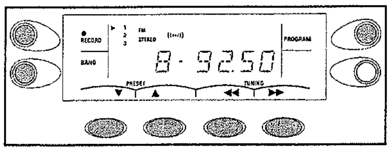

RECORD
FM
PROGRAM
BAND
1 - 90.30
PRESET
TUNING

1. Press **TUNER** on the unit or on the remote control.
2. Press PROGRAM for less than one second.
   - → PROGRAM flashes on the display.
3. Press BAND to select the desired waveband : FM or MW.
4. Press TUNING ◀◀ or ▶▶ to tune to the desired frequency.
5. Press PRESET ▼ or ▲ (or **PREV |◀ / NEXT ▶|** on the remote control) to select a preset number.
6. Press PROGRAM again.
   - → PROGRAM stop flashing, and the station is stored.

- Repeat the above procedure to store other preset stations.

Tuning to Preset Stations

- Press PRESET ▼ or ▲ (or **PREV |◀ / NEXT ▶|** on the remote control) to select the desired preset number.
  - → The preset number, frequency and waveband appear on the display.


RECORD
STEREO
FM
PROGRAM
BAND
8 - 92.50
PRESET
TUNING

Changing the FM/MW tuning grid

(for specific versions only)

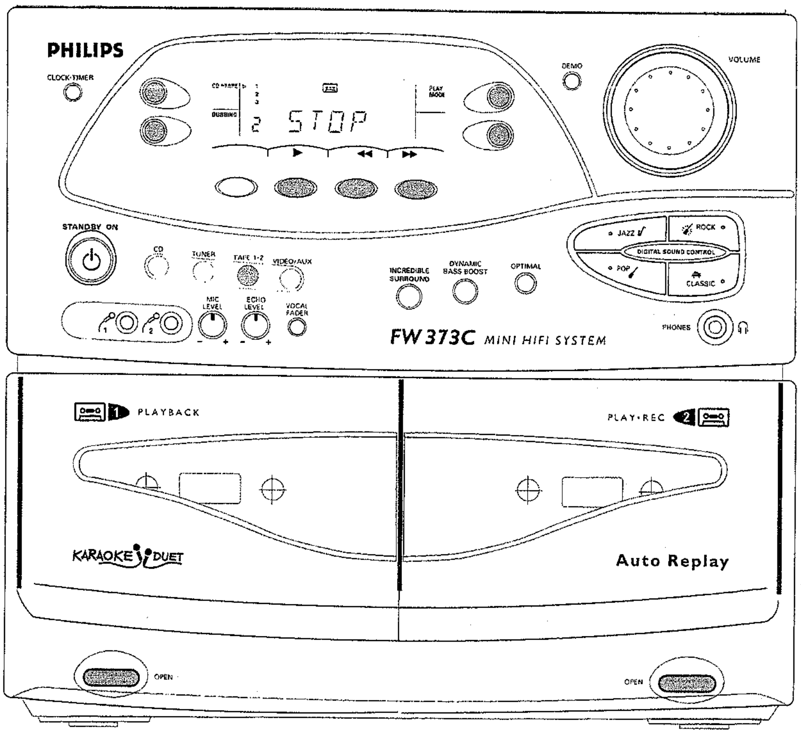
For FM Band : change from 50kHz to 100kHz or vice versa
For MW Band : change from 9kHz to 10kHz or vice versa

Changing of tuning grid will erase all previously stored preset stations.

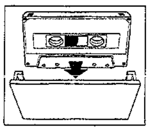
While in TUNER mode, press the **TUNER** button for ***more than 5 seconds***. Display will shows "GRID 10" or "GRID 9".

Note:
GRID 9 indicates that the tuning grid is in step of 50kHz in FM band or 9kHz in MW band. GRID 10 indicates that the tuning grid is in step of 100kHz in FM band or 10kHz in MW band.

CASSETTE DECK


PHILIPS
CLOCK-TIMER
CD•TAPE
DUBBING
2 STOP
PLAY MODE
DEMO
VOLUME
STANDBY ON
CD
TUNER
TAPE 1-2
VIDEO/AUX
MIC LEVEL
ECHO LEVEL
VOCAL FADER
INCREDIBLE SURROUND
DYNAMIC BASS BOOST
OPTIMAL
JAZZ
ROCK
DIGITAL SOUND CONTROL
POP
CLASSIC
PHONES
FW 373C MINI HIFI SYSTEM
1 PLAYBACK
PLAY•REC 2
KARAOKE DUET
Auto Replay
OPEN
OPEN

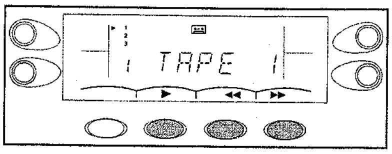
Loading a cassette



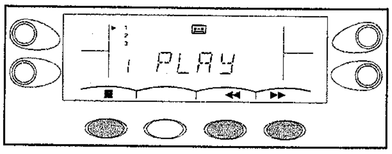
- Press **OPEN**.
- The cassette compartment door opens.
- Load the cassette with the open side downward and the full spool to the left.
- Close the cassette compartment door.
  → The deck automatically selects the cassette type (NORMAL or CHROME (CrO_2)).

Tape Playback

1 Press **TAPE 1-2** (or **TAPE** on the remote control) to select either TAPE DECK 1 or TAPE DECK 2.



2 Load the cassette into the desired **cassette deck**.
3 Press ▶ (or **PLAY** ▶ on the remote control) to start playback.



4 Press ■ (or **STOP** ■ on the remote control) to end playback.

CASSETTE DECK

Note:
When the cassette has stopped playing, the set will switch to the standby mode automatically after 15 minutes if no button is pressed.

Auto Replay

The PLAY mode enables you to select AUTO REPLAY mode for both Tape Deck 1 and 2.

- Default setting of set is with AUTO REPLAY mode.
- Press PLAY mode once, display scrolls 'ONCE' message once and **ONCE** mode is selected.
- Press PLAY mode again, display scrolls 'AUTO REPLAY' message once and **AUTO REPLAY** mode is selected.

AUTO REPLAY:
- When the cassette reaches its end during tape play, it will rewind by itself to the beginning and starts playing again. This will be repeated for 10 times. During the rewinding of the cassette, display keeps scrolling 'AUTO REPLAY'.

ONCE:
- When the cassette reaches its end during tape play, it will stop.

Note:
This feature is only applicable during Tape Play.

Winding/Rewinding

At the stop mode

1 You can rewind or wind the cassette by pressing ◀◀ or ▶▶, (◀◀ or ▶▶ on the remote control) respectively.
→ The cassette will stop automatically at the end of the winding or rewinding

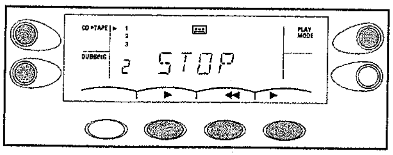
2 Press ■ (or **STOP** ■ on the remote control) to stop winding or rewinding.

During playback

1 You can search for a particular passage or beginning of a track by pressing and holding ◀◀ or ▶▶, (◀◀ or ▶▶ on the remote control) respectively.
→ During searching, the sound is reduced to a low volume.
→ When you release ◀◀ or ▶▶, the cassette continues playing.

Note:
During winding or rewinding a cassette, it is possible to select another source mode (e.g. TUNER, CD or VIDEO/AUX mode).

Recording from other sources (only on Tape Deck 2)


CD•TAPE
DUBBING
2 STOP
PLAY MODE

1 Press **TAPE 1-2** to select **tape deck 2**.
2 Load a blank cassette into **tape deck 2**.
3 Press **CD**, **TUNER** or **VIDEO/AUX**.
4 Press ● RECORD to start recording.
→ The RECORD flag starts flashing.
5 Press STOP ■ to stop recording.

Note:
During recording, it is not possible to listen to another sound source.

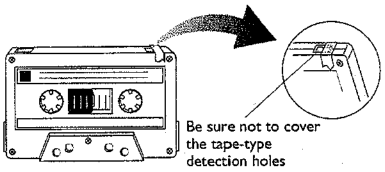
Dubbing cassettes (from Tape Deck 1 to Tape Deck 2)

1 Press **TAPE 1-2** to select **tape deck 2** .
2 Load the prerecorded cassette into **tape deck 1** and a blank cassette into **tape deck 2**.
→ Make sure that both cassettes have their full spools to the left.
3 Press DUBBING and then press ◀◀ or ▶▶ for respective dubbing speed mode.
→ NORMAL (normal speed) or FAST (high speed) appears on the display.
4 Press DUBBING again to start recording.
→ The RECORD flag starts flashing.
→ HSD appears on the display for high speed dubbing.
5 Press ■ to stop dubbing.

Notes:
- At the end of side A, flip the cassettes to side B and repeat the procedure.
- Dubbing of cassettes is only possible in the TAPE DECK 2. To ensure good dubbing, use cassettes of the same length.
- During high speed dubbing in Tape mode, the sound is reduced to a low volume.
- You can switch to other sound source while dubbing.

General Information

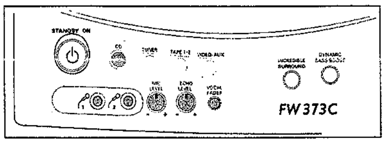
- For recording, use only a cassette of IEC type I (normal cassette) or IEC type II (Chrome). The respective cassette type is selected automatically.
- The tape in the cassette is secured at both ends with leader tape. At the beginning and end of a cassette, nothing will be recorded for six to seven seconds.
- The recording level is set automatically, regardless of the position of VOLUME.
- Check and tighten slack tape with a pencil before use. Slack tape may get jammed or may burst in the mechanism.
- To prevent accidental recording, break out the tab on the left shoulder of the cassette side you want to protect. To re-record the cassette, cover each hole with cellophane tape. Do not cover the Chrome tape detection hole when covering the tab opening.


Be sure not to cover the tape-type detection holes

- C-120 tape is extremely thin and may be easily deformed or damaged. It is not recommended for use in this unit.
- Store the cassettes at room temperature and do not put them too close to a magnetic field (for example, transformers, TVs or speakers).

Karaoke

(for specific versions only)


STANDBY ON
CD
TUNER
TAPE 1-2
VIDEO/AUX
INCREDIBLE SURROUND
DYNAMIC BASS BOOST
MIC LEVEL
ECHO LEVEL
VOCAL FADER
FW373C

Microphone mixing

1 Set the **MIC LEVEL** control to the minimum level to prevent acoustic feedback (e.g. a loud howling sound) before you connect the microphone.
2 Connect either 1 or 2 microphones to the mic socket.
3 Press **CD**, **TUNER**, **TAPE 1-2** or **VIDEO/AUX**.
4 Play the selected source.
5 Adjust the volume with **VOLUME** control.
6 Adjust the **MIC LEVEL** control to the mixing level that you want.
7 Adjust the **ECHO LEVEL** control to the echo level that you want.
8 Press **VOCAL FADER** to suppress the vocals on special recorded Karaoke CDs.
→ When the VOCAL FADER is switched on, the 🎤 appears on the display.
9 Start singing or talking through the microphone.

Recording the mixed sound

During microphone mixing, you can record the mixed sound on a cassette in TAPE DECK 2.

1 Load a blank cassette in **tape deck 2.**
2 Press ● RECORD.

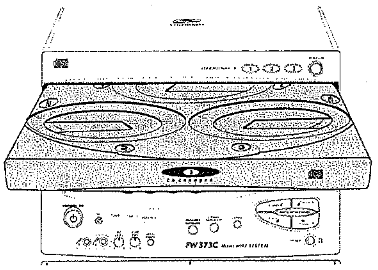
Notes:
1. *For maximum VOCAL FADER effect, you are advised to switch off the Incredible Surround.*
2. *If you do not intend to record via the microphone, unplug the microphone to avoid accidental mixing with other recording source.*

Warning!

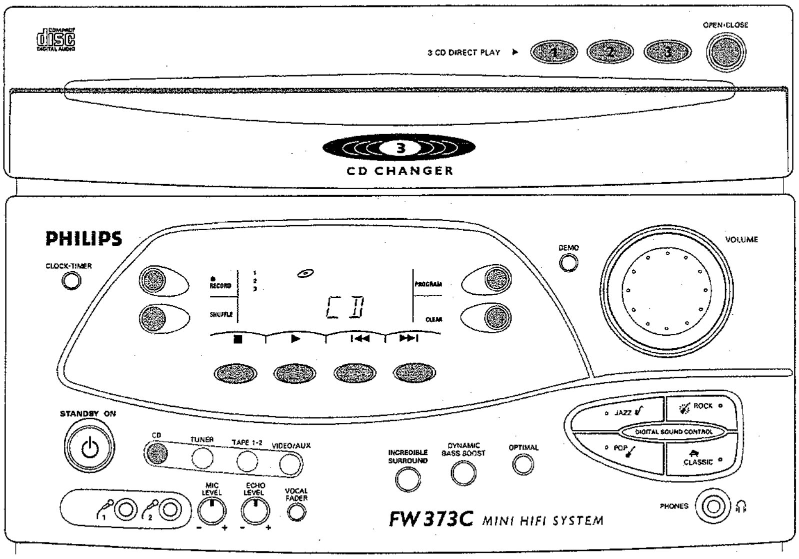
1) This set is designed for conventional CDs. Do not use any accessories like disc stabilizer rings or CD treatment sheets, etc. which may damage the CD mechanism.
2) Do not load more than one disc into each tray.
3) When the CD changer is loaded with CD(s), do not turn over or shake the unit as this may jam the changer mechanism.

You can load up to three discs in the CD changer for continuous play without interruption. In addition to the conventional 12-cm disc, 8-cm discs can also be used without an adaptor.

Loading the CD Changer



1 Press **CD** on the set or remote control to select CD.
2 Press **OPEN•CLOSE**.
→ The CD compartment slides out.
3 Load a disc with the ***printed side up*** in the right tray.
- You can load another disc in the left tray.
- To load the third disc, press the corresponding **3 CD DIRECT PLAY** button of the empty tray.


OPEN•CLOSE
3 CD DIRECT PLAY ►
1
2
3
3
CD CHANGER
PHILIPS
CLOCK•TIMER
RECORD
SHUFFLE
CD
PROGRAM
CLEAR
DEMO
VOLUME
JAZZ
ROCK
DIGITAL SOUND CONTROL
POP
CLASSIC
STANDBY ON
CD
TUNER
TAPE 1-2
VIDEO/AUX
INCREDIBLE SURROUND
DYNAMIC BASS BOOST
OPTIMAL
MIC LEVEL
ECHO LEVEL
VOCAL FADER
PHONES
FW373C MINI HIFI SYSTEM

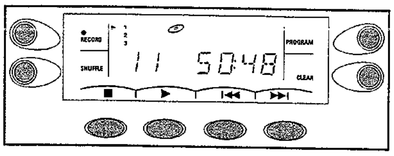
→ The CD changer carousel will rotate until the empty tray is at the right hand side and is ready for loading.
→ Playback will always start with the outer right disc tray.
4 Press **OPEN•CLOSE** to close the CD compartment.
→ The total number of tracks and playing time of the last selected disc appear on the display.

The following display indications will help you to know whether the disc trays are empty or loaded.

1 – indicates the disc tray 1 is empty.
② – indicates the disc tray 2 is loaded with a disc.
►③ – indicates the disc tray 3 is loaded and selected.

Playing a Disc

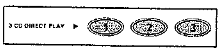
1 Press ▶ (or **PLAY** ▶ on the remote control) to start play.
→ The track number and elapsed playing time of the current track appear on the display.



- To interrupt play, press ❚❚ (or **PAUSE** ❚❚ on the remote control).
→ The playing time flashes.
- To resume play, press ▶ again (or **PLAY** ▶ on the remote control).

2 To stop play, press ■ (or **STOP** ■ on the remote control).

Note :
All the available discs will play once, then stop. When the CD has stopped playing, the set will switch to the standby mode after 15 minutes if no button is pressed.



When the CD tray is closed, you can play a CD directly by pressing the **3 CD DIRECT PLAY** (**1** – **3**) buttons (or **DISC UP** on the remote control). The CD player will stop at the end of playback of the selected disc.

Selecting a desired track

Selecting a desired track at the stop mode

1 Press ⏮ or ⏭ (or **PREV** ⏮ / **NEXT** ⏭ on the remote control) until the desired track appears on the display.

2 Press ▶ (or **PLAY** ▶ on the remote control) to start playback.
→ The selected track number and elapsed playing time appear on the display.

Selecting a desired track during play mode

1 Press ⏮ or ⏭ (or **PREV** ⏮ / **NEXT** ⏭ on the remote control) until the desired track appears on the display.
→ The selected track number and elapsed playing time appear on the display.

- If you press ⏮ once it will skip to the beginning of the current track and play the track again.

Searching for a particular passage during play

- Press and hold ⏮ or ⏭ (or ◀◀ or ▶▶ on the remote control) until the desired passage is located. During the search, the sound is played faster than normal at a reduced volume. Play returns to normal when ⏮ or ⏭ is released.

Shuffle

SHUFFLE – playing all the available discs and their tracks in random order. It can also be used when tracks are programmed.

To shuffle all the discs and tracks

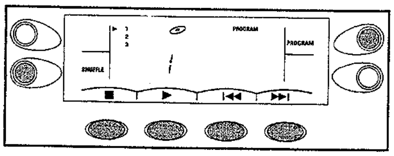
1 Press SHUFFLE.
→ "SHUFFLE" flashes briefly on the display.
→ The SHUFFLE flag, the disc and the track selected at random appear on the display.

- The discs and the tracks will now be played in random order until you press ■.

2 Press SHUFFLE again to resume normal playback.
→ The SHUFFLE flag disappears from the display.

Programming Tracks

Programming tracks of a loaded CD is possible when CD playback is stopped. The display will indicate the total tracks stored in the program. Up to 40 tracks can be stored in the memory in any order. When 40 tracks are stored and you attempt to store another track, the display will show "PROGRAM FULL".



1 Load the desired disc in the disc trays.
2 Press PROGRAM to start programming.
→ The PROGRAM flag flashes on the display.
3 Press the desired disc button to select the disc.
4 Press ⏮ or ⏭ to select the desired track.

5 Press PROGRAM to store the track.
- Repeat steps **3** to **5** to store other discs and tracks.

6 Press ■ once to end programming.
→ The total number of tracks programmed and total playing time will appear on the display.

Note:
If the total playing time is more than "99:59" or one of the programmed tracks has a number greater than 30, then "- - : - -" is displayed instead of the total playing time.

Playing the program

1 Press ▶ again (or **PLAY** ▶ on the remote control) to start program playback.
→ "PROGRAM PLAY" appears on the display.
→ The track number and elapsed playing time of the current track will appear on the display.

2 Press ■ (or **STOP** ■ on the remote control) to stop program playback.

Note:
If you press any of the 3 CD DIRECT PLAY buttons, the set will play the selected disc or track and the stored program will be ignored temporary. The PROGRAM flag will also temporarily disappear from the display and then reappear when the playback for the selected disc ends.

Reviewing the program

Reviewing of a program is only possible when CD playback is stopped.

- Press ⏮ or ⏭ repeatedly to review the programmed tracks.
- Press ■ to exit review mode.

Erasing the program (when playback is stopped)

- Press CLEAR.
→ "PROGRAM CLEARED" appears on the display.

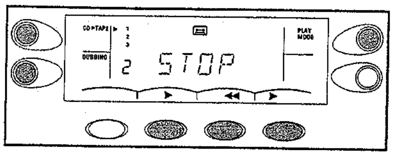
Note:
The program is also erased when the set is disconnected from the power supply. If the CD carousel tray is opened, the tracks belonging to the outer two trays will be erased and "CLEARED" will scroll on the display once.

CD Synchro Start Audio Recording

During CD synchro start audio recording,

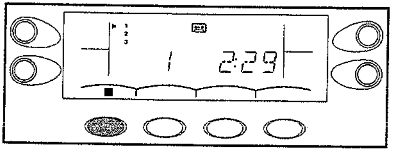
- It is not advisable to fast forward/rewind your cassette in TAPE DECK 1.
- It is not possible to listen to another sound source.

1 Press **CD** on the unit or on the remote control to select CD mode.
2 Load a disc into the disc tray.
3 You can program the tracks in the order you want them to be recorded (see Programming Tracks). If not, the tracks are recorded according to the disc.
4 Press **TAPE 1-2** (or **TAPE** on the remote control) to select **tape deck 2**.



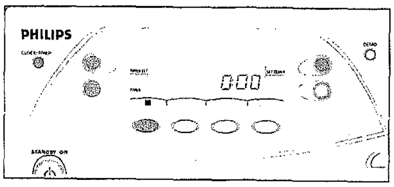
5 Load a blank cassette (full spool to the left) into **tape deck 2**.

6 Press CD ▶ TAPE to start recording.
→ The RECORD flag flashes on the display.
→ The CD starts playing after a seven-second delay to prevent recording on the leader tape at the beginning of the cassette.



7 Press ■ to stop recording.

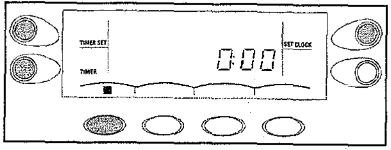
CLOCK SETTING



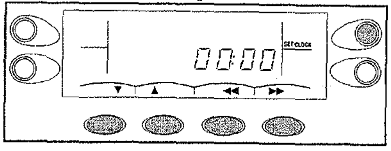
Setting the clock

The clock is in 24-hour mode, e.g. 00:00 or 23:59.

1 Press **CLOCK•TIMER**.
→ "0:00" starts flashing.



2 Press SET CLOCK.
→ "00:00" starts flashing.



3 Set the hour with ▼ or ▲.
4 Set the minutes with ◀◀ or ▶▶.
5 Press SET CLOCK again to store the setting.
→ The clock starts running.

Note:
When a power interruption occurs, the clock settings are erased.

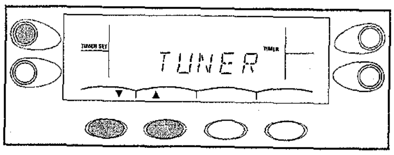
TIMER SETTING

Setting the Timer

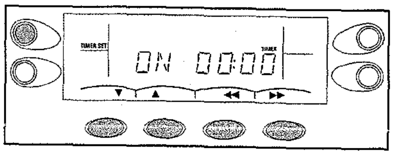
- The system can switch on to CD, TUNER or TAPE 1 mode automatically at a preset time. It can serve as an alarm to wake you up. After half an hour from the preset time, the system will return to the standby mode if no button is pressed.
- Before setting the timer, make sure the clock is set correctly.
- The timer works only once for each setting.
- **The volume of the timer will be at the last setting before the set is switched to standby mode.**

Timer Setting

1 Press **CLOCK•TIMER**.
2 Press TIMER SET.
→ The TIMER flag flashes.



3 Press ▼ or ▲ to select the desired source.
→ The display will switch as follows:
TUNER → CD → TAPE 1 → TUNER ...
4 Press TIMER SET to confirm your selection.
→ The display will show "ON 00:00 " and "00:00" flashes.



5 Press ▼ or ▲ to set the hour for the timer to start.
6 Press ◀◀ or ▶▶ to set the minutes for the timer to start.
7 Press TIMER SET to store the start time.
→ The TIMER is now set.
→ The TIMER flag remains lit.

To stop the TIMER

1 Press **CLOCK•TIMER**.
2 Press TIMER on the set.
→ The TIMER is now off.

To start the TIMER again

1 Press **CLOCK•TIMER**.
2 Press TIMER on the set.
→ The display will show the last set start time of the TIMER and its flag.
→ The TIMER flag remains lit.

Notes:
1. *If the source selected is TUNER, the last tuned frequency will be switched on.*
2. *If the source selected is CD, the first track of the last selected disc will be played. If the CD trays are empty, the TUNER source will be selected instead.*
3. *If the source selected is TAPE 1, when the preset time is reached during high speed dubbing, the TUNER source will be selected instead.*

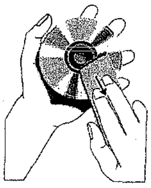
MAINTENANCE

Maintenance

Cleaning the Cabinet

- Use a soft cloth slightly moistened with a mild detergent solution. Do not use a solution containing alcohol, spirits, ammonia or abrasive.

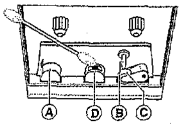
Cleaning Discs



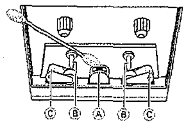
- When a disc becomes dirty, clean it with a cleaning cloth. Wipe the disc from the center out.
- Do not use solvents such as benzine, thinner, commercially available cleaners, or antistatic spray intended for analog records.

Cleaning the Heads and the Tape Paths

- To ensure good recording and playback quality, clean the heads Ⓐ and Ⓓ, the capstan(s) Ⓑ, and pressure roller(s) Ⓒ after every 50 hours of tape operation.



Tape Deck 1



Tape Deck 2

- Use a cotton swab slightly moistened with cleaning fluid or alcohol.
- You can also clean the head by playing a cleaning tape through once.

Demagnetizing the heads

- Use a demagnetizing cassette available at your dealer.

SPECIFICATIONS

Specifications

AMPLIFIER

Output power	2 x 25 W RMS
	600 W PMPO
Power band width	40 - 20000 Hz
Frequency response	40 - 20000 Hz
Signal-to-noise ratio	≥ 75 dBA
Stereo separation	≥ 48 dB (1 kHz)
Input sensitivity	
Auxiliary	400 mV
Microphone *(for specific versions only)*	2.5 mV
Outputs	
Speakers	≥ 3 Ω
Headphones	32 Ω - 1000 Ω

TUNER

FM wave range	87.5 - 108 MHz
MW wave range	
9 kHz Grid	531 - 1602 kHz
10 kHz Grid	530 - 1700 kHz
Sensitivity at 75 Ω, 26 dB S/N ratio, FM mono	2.8 µV
46 dB signal-to-noise ratio, FM Stereo	41.2 µV
FM Frequency response	63 - 12500 Hz (±3 dB)
Signal-to-noise ratio	≥ 50 dBA
Total Harmonic Distortion	< 3%

CD PLAYER

Frequency range	20 - 20000 Hz
Signal-to-noise	≥ 86 dBA
Channel separation	≥ 40 dB
Total harmonic distortion	≤ 65 dB

CASSETTE DECK

Frequency range	
CrO_2 tape (type II)	80 - 12500 Hz (±8 dB)
Normal tape (type I)	80 - 12500 Hz (±8 dB)
Signal-to-noise ratio	
CrO_2 tape (type II)	≥ 48 dBA
Normal tape (type I)	≥ 44 dBA
Wow and flutter	≤ 0.4% DIN

MAIN UNIT

Material/finish	Metal and polystyrene
Dimensions (w x h x d)	265 x 316 x 363 (mm)
Weight	7 kg approx.

SPEAKER BOX

Dimensions (w x h x d)	210 x 310 x 220 (mm)
Weight	2.8 kg approx.
Speaker woofer	1 x 5.25 inch
Speaker tweeter	1 x 2.5 inch
Speaker piezo	1 x 1 inch

Subject to modification

TROUBLESHOOTING GUIDE

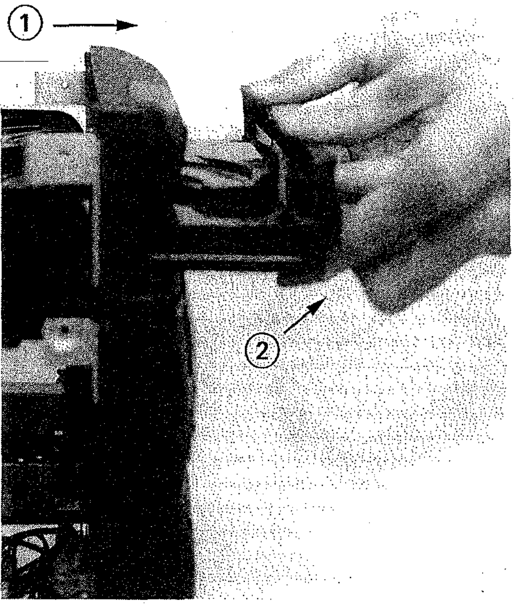
Warning! Under no circumstances should you try to repair the set yourself, as this will invalidate the warranty.

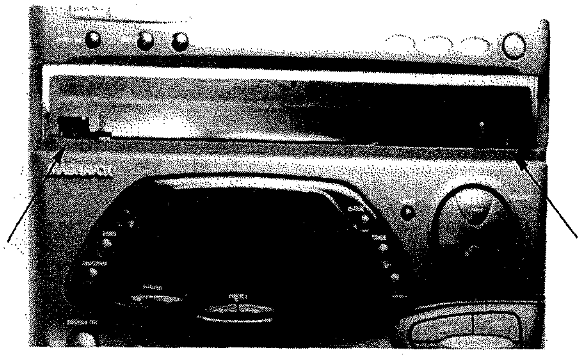
- If a fault occurs, check the points listed below before taking the set in for repair.
- Should any problems persist after you have made these checks, consult your nearest dealer or service center.

SYMPTOM	POSSIBLE CAUSE	REMEDY
RADIO RECEPTION		
The STEREO indicator flashes.	The signal is too weak.	Adjust the antenna.
Severe hum or noise.	The signal strength is too weak.	Adjust the antenna.
	The TV or VCR is too close to the stereo system.	Separate the stereo system from the TV or VCR. Connect an external antenna for better reception.
CASSETTE DECK OPERATION		
"CANNOT RECORD" is displayed.	No cassette in the cassette deck.	Insert a blank cassette into the cassette deck.
	The protection tab has been broken.	Put a piece of clear adhesive tape over the opening.
"RECORDING ACTIVE" is displayed.	A recording is active.	Stop the recording or wait unitl it is finished.
Recording or playback cannot be made or there is a decrease in audio level.	Dirty tape heads.	See section on cassette deck maintenance.
	Magnetic build-up in the record/playback head.	Use demagnetizing cassette.
Excessive wow or flutter, or sound drop-out.	Contamination of the capstans or pressure rollers.	See section on cassette deck maintenance.
CD PLAYER OPERATION		
"WRONG TRACK" is displayed.	The selected track number does not exist on this CD or it is not included in this program.	Select a correct track number.
"NO DISC" is displayed.	The disc is inserted upside down.	Place CD with printed side up.
	Moisture condensation.	Wait until lens has adjusted to normal room temperature.
	There is no disc in the CD tray.	Insert a CD.
	The CD is dirty, badly scratched or warped.	Replace or clean the CD.
GENERAL		
Set not working.	Set does not react when buttons are pressed.	Press STANDBY-ON to switch the unit off, then switch it on again. Or, unplug the AC power plug from the wall outlet, then plug it in again.
No or poor sound.	Volume is not turned up.	Adjust VOLUME.
	The headphones are connected.	Disconnect the headphones.
	Speakers are not connected or are connected wrongly.	Check that the speakers are connected correctly. Make sure that the stripped speaker wire is clamped.

Reversed left and right sound.	Speakers are connected wrongly.	Check the speaker connections and speaker location.
Lack of bass sound or apparently imprecise physical location of musical instruments.	Speakers are connected wrongly.	Check the speaker connection for proper phasing, red/black wires to red/black terminals.
Clock blinking.	There was a power disruption.	Reset the clock.
Remote control has no effect on the set.	The distance to the system is too large.	Reduce the distance.
	Batteries are inserted incorrectly.	Insert the batteries correctly.
	Batteries are exhausted.	Replace the batteries.
	Wrong sound source is selected.	Select the sound source before pressing the function button (PLAY, PREV./NEXT, etc.).
Timer not working.	Timer not on.	Press CLOCK•TIMER on the set to switch on the timer.
	Dubbing/recording is active.	Stop dubbing/recording.
"PRESS DEMO TO EXIT" is displayed.	Demo mode is switched on.	Press STANDBY-ON or DEMO to switch off the demo.

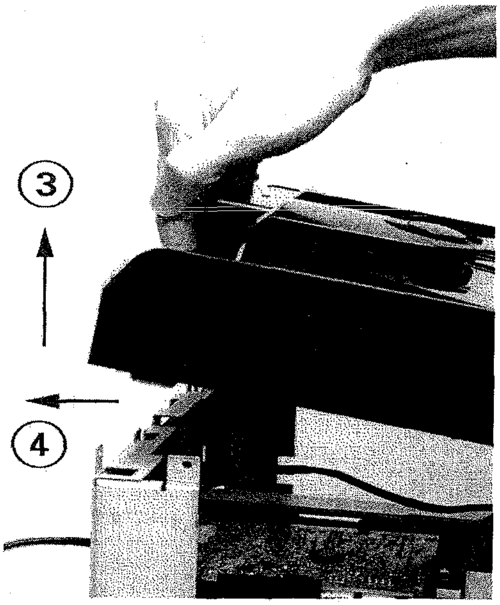
Dismantling of Front



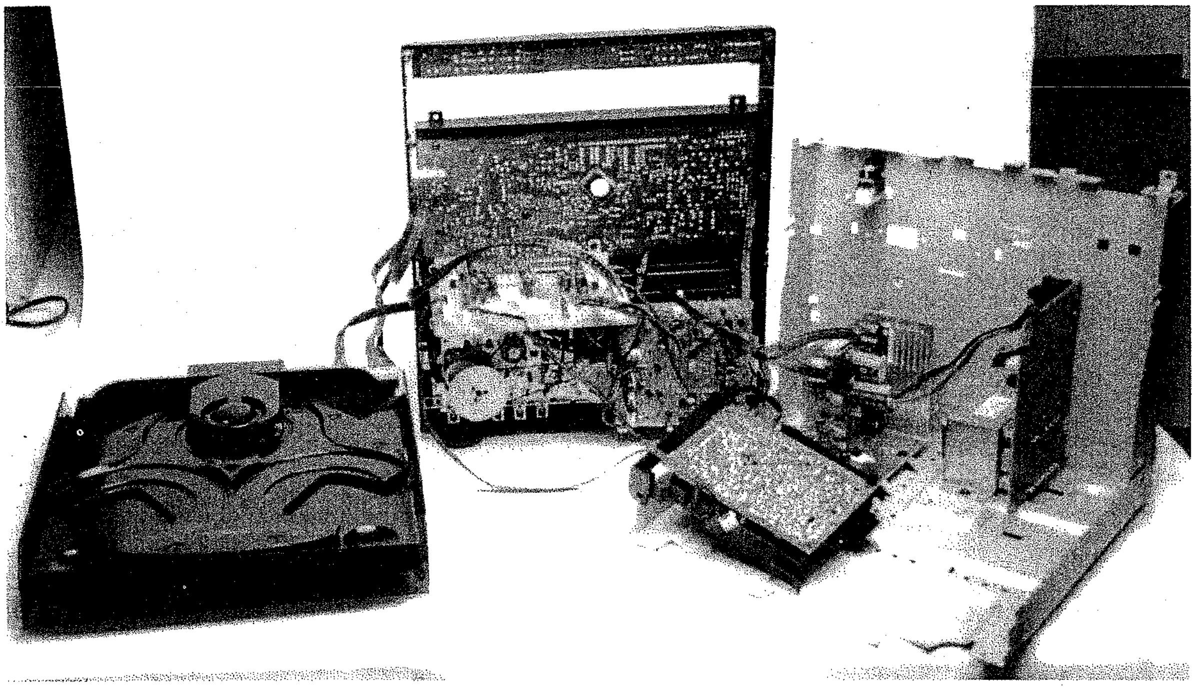


1) Remove top cover
2) Loosen 3X screw on bottom
3) Slide the CD tray out as shown in arrow 1.
4) Remove the CD door as indicated.

5) Loosen 2X screw from the front panel at the CD tray.



6) Lift the CDC module up and remove the module as indicated in arrow 3.



5) Service position

SERVICE TEST PROGRAM

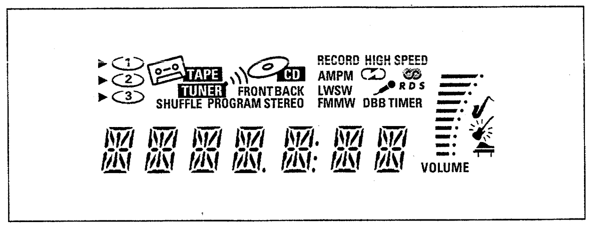
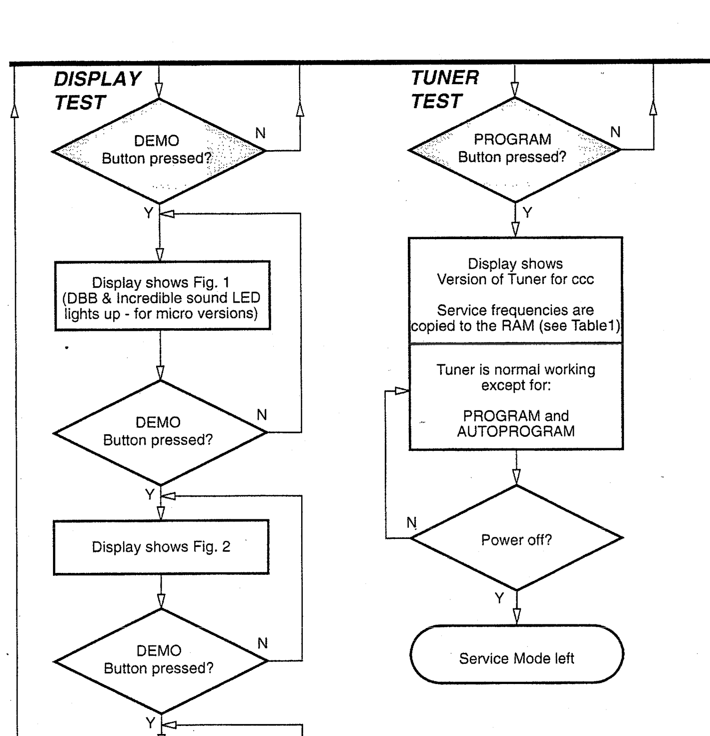
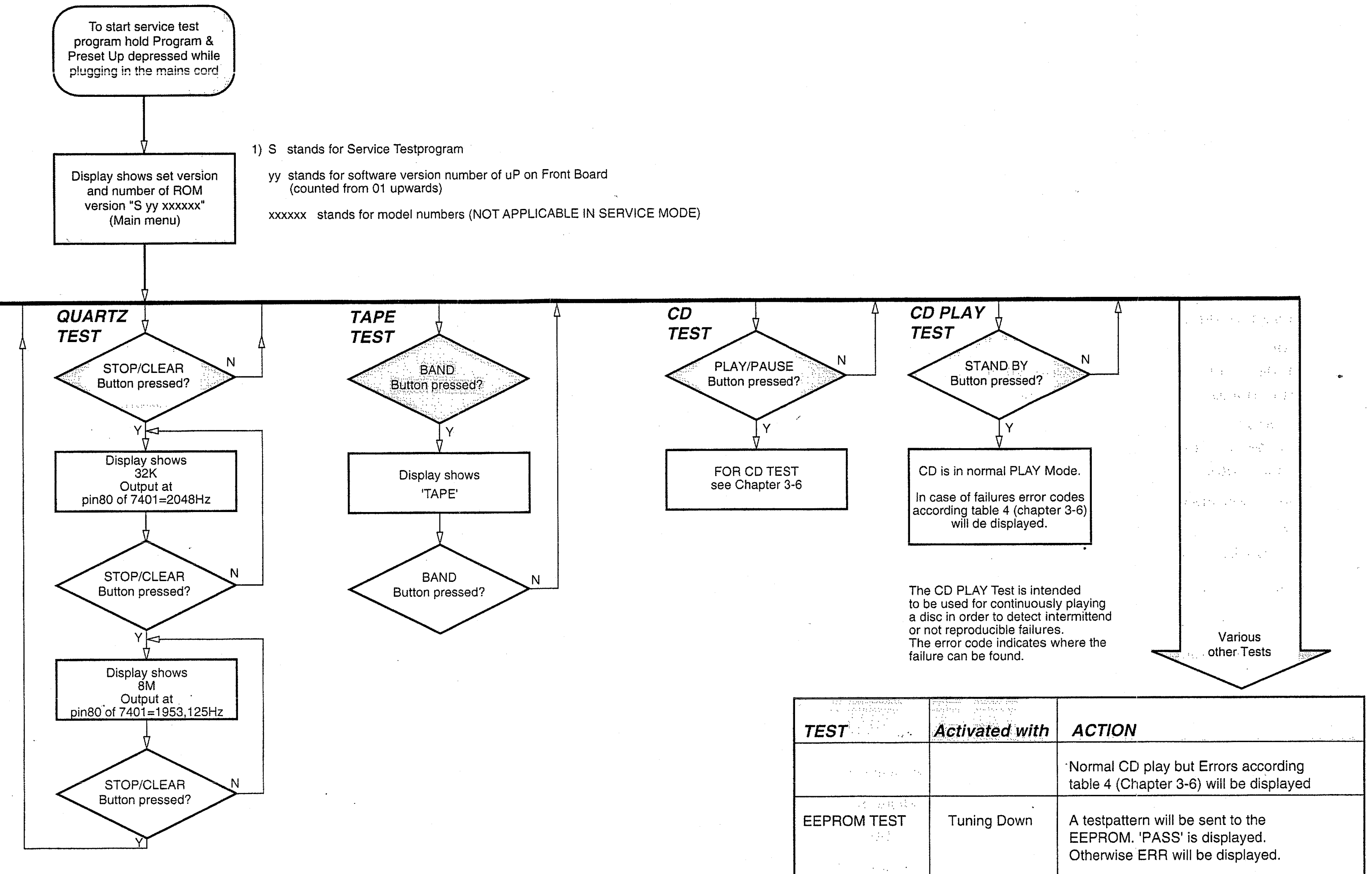

TAPE
CD
TUNER
FRONT BACK
SHUFFLE PROGRAM STEREO
RECORD HIGH SPEED
AMPM
LWSW
FMMW DBB TIMER
RDS
VOLUME

Figure 1



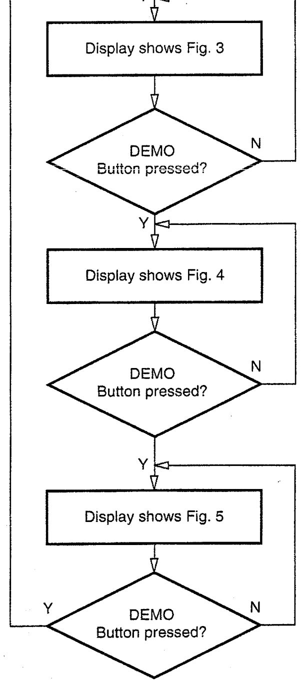

To start service test program hold Program & Preset Up depressed while plugging in the mains cord
Display shows set version and number of ROM version "S yy xxxxxx" (Main menu)
DISPLAY TEST
DEMO Button pressed?
N
Y
Display shows Fig. 1 (DBB & Incredible sound LED lights up - for micro versions)
TUNER TEST
PROGRAM Button pressed?
N
Y
Display shows Version of Tuner for ccc
Service frequencies are copied to the RAM (see Table1)
Tuner is normal working except for:
PROGRAM and AUTOPROGRAM
Power off?
N
Y
Service Mode left
QUARTZ TEST
STOP/CLEAR Button pressed?
N
Y
Display shows 32K Output at pin80 of 7401=2048Hz
STOP/CLEAR Button pressed?
N
Y
Display shows 8M Output at pin80 of 7401=1953,125Hz
STOP/CLEAR Button pressed?
N
Y
TAPE TEST
BAND Button pressed?
Y
Display shows 'TAPE'
BAND Button pressed?
N
CD TEST
PLAY/PAUSE Button pressed?
N
Y
FOR CD TEST see Chapter 3-6
CD PLAY TEST
STAND BY Button pressed?
N
Y
CD is in normal PLAY Mode.
In case of failures error codes according table 4 (chapter 3-6) will de displayed.
Various other Tests

1) S stands for Service Testprogram

yy stands for software version number of uP on Front Board (counted from 01 upwards)

xxxxxx stands for model numbers (NOT APPLICABLE IN SERVICE MODE)

The CD PLAY Test is intended to be used for continuously playing a disc in order to detect intermittend or not reproducible failures. The error code indicates where the failure can be found.


DEMO Button pressed?
N
Y
Display shows Fig. 2
DEMO Button pressed?
N
Y
Display shows Fig. 3
DEMO Button pressed?
N
Y
Display shows Fig. 4
DEMO Button pressed?
N
Y
Display shows Fig. 5
DEMO Button pressed?
Y
N

PRESET	Europe "EUR"	East Europe "EAS"	USA "USA"	Oversea "OSE"	Korea "KOR"
1	87.5MHz	65.81MHz	87.5MHz	87.5MHz	87.5MHz
2	108MHz	108MHz	108MHz	108MHz	108MHz
3	531kHz	74MHz	530kHz	531/530kHz	531kHz
4	1602kHz	87.5MHz	1700kHz	1602/1700kHz	1602kHz
5	558kHz	531kHz	560kHz	558/560kHz	558kHz
6	1494kHz	1602kHz	1500kHz	1494/1500kHz	1494kHz
7	153kHz	558kHz	98.0MHz	87.5MHz	87.5MHz
8	279kHz	1494kHz	87.5MHz	87.5MHz	87.5MHz
9	198kHz	153kHz	87.5MHz	87.5MHz	87.5MHz
10	98MHz	279kHz	87.5MHz	87.5MHz	98MHz
11	87.5MHz	198kHz	87.5MHz	98MHz	98MHz

Table 1

East Europe Tuner IF offset correction

1) Input a reference frequency 87.5MHz from the generator.
2) Proceed to the Tuner Test mode. (Press PROGRAM button).
3) Offset calibration will start to calibrate automatically. (Display will show XX)

XX : offset value

TEST	Activated with	ACTION
		Normal CD play but Errors according table 4 (Chapter 3-6) will be displayed
EEPROM TEST	Tuning Down	A testpattern will be sent to the EEPROM. 'PASS' is displayed. Otherwise ERR will be displayed.
EEPROM CLEAR	Preset Down	Load default data. Display shows NEW for 1 second. ***Caution!*** ***All presets from the customer are lost!!***
KEY TEST	Preset Up	Key numbers according table 5 are shown on the display. (see Chapter 3-6)
FAST CLOCK TEST	DBB	The clock is switched to fast mode. 'FAST' is displayed for 2 sec. Press DBB again to reset the clock to normal. 'NOM' displayed for 2 sec.
LEAVE SERVICE TESTPROGRAM	disconnect mains	

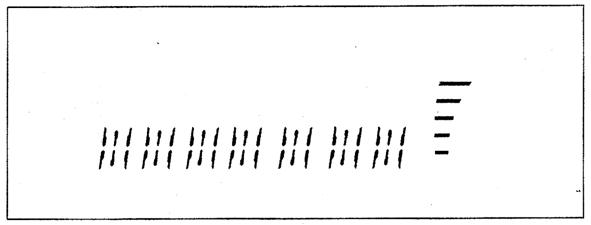


Figure 2

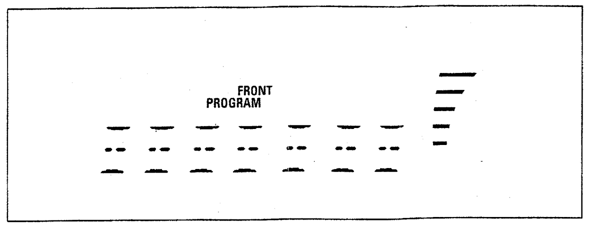

FRONT
PROGRAM

Figure 3

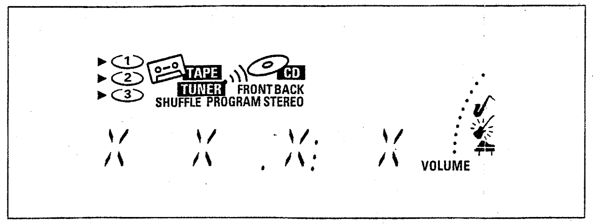

TAPE
CD
TUNER
FRONT BACK
SHUFFLE PROGRAM STEREO
VOLUME

Figure 4

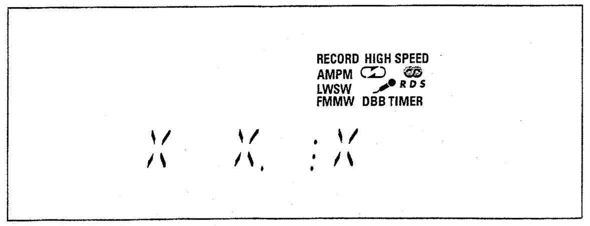

RECORD HIGH SPEED
AMPM
LWSW
FMMW DBB TIMER
RDS

Figure 5

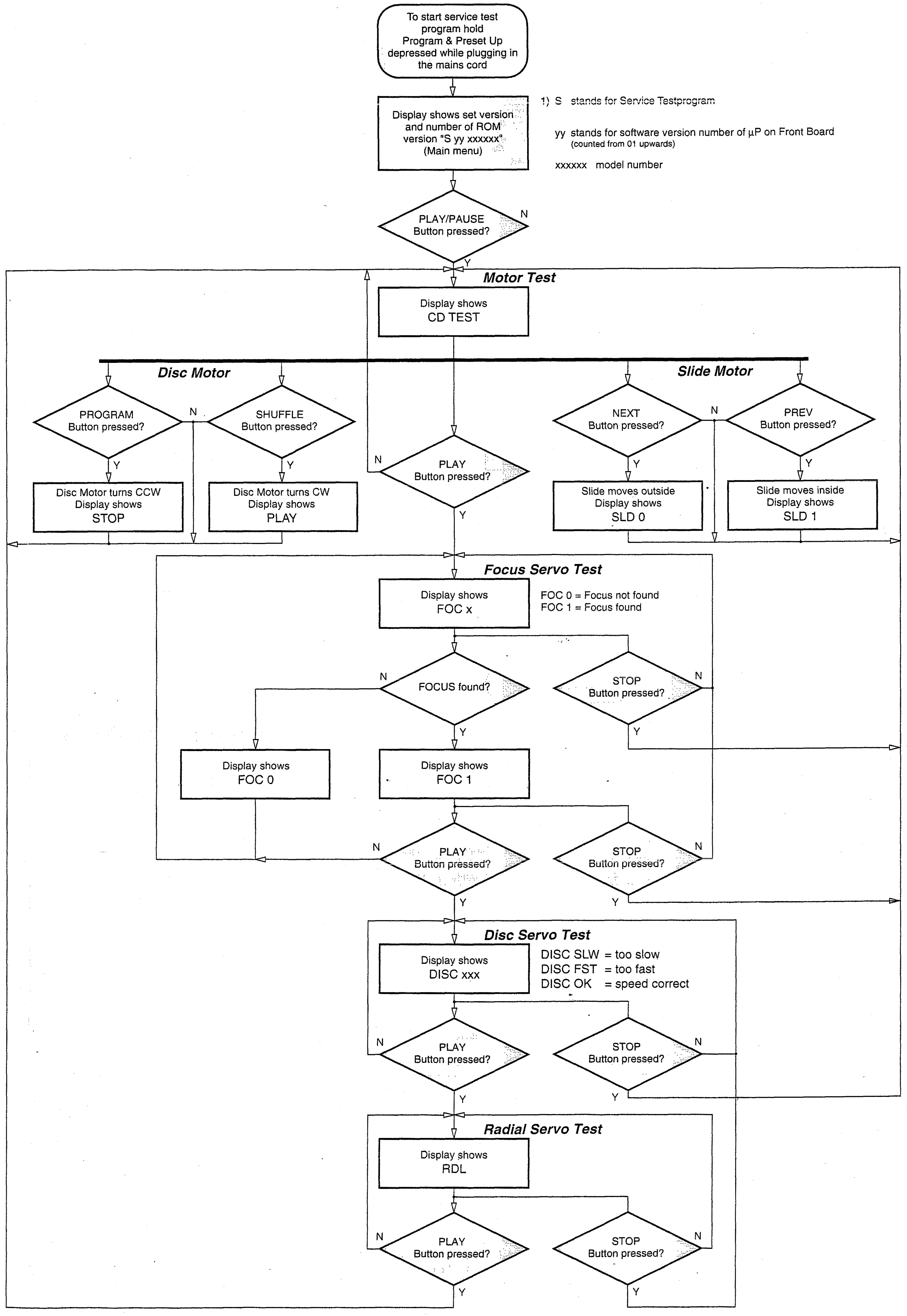
Error number	CD Error description
E 1002	Focus error Triggered when the focus could not found within a certain time when starting up the CD, or when the focus is lost for more than a certain time during playing the CD.
E 1007	Subcode error (no subcode within certain time)
E 1008	TOC error Triggered when during reading the TOC the lead-in(track nr. 0) is left. This can be caused by a misaligned Inner-switch or by a disc with a mispositioned lead-in.
E 1010	Radial error Triggered when the radial servo is not on track for a certain time during playing the CD.
E 1011	Sledge error Generated when the Inner-switch did not open within a certain time when the pickup is moved to the inner position.
E 1012	Fatal sledge error Triggered when the Inner-switch did not close within a certain time when moving the pickup inside. Inner-switch or sledge motor problem.
E 1013	Turnatble motor error Generated when the CD did not reach 75% of speed during startup within a certain time. Disc motor problem.
E 1014	Jump-offtrack error (too less grooves within time)
E 1020	PLL locked error Triggered when the PLL of the decoder did not locked within a certain time.
E 1070	Carousel blocked in a disc position
E 1071	Carousel blocked in the middle
E 1075	Drawer blocked in the middle
E 1076	Drawer blocked in open or closed state

For FW335/FW363

Key activated	Display	Key activated	Display	Key activated	Display
Stop/Clear	01	Clock Set	11	Incredible Sound	21
Program (CD)	02	Timer Set	12	Dbb	22
Shuffle	03	Timer On/Off	13	Optimal	23
Search/Prev	04	Demo	14	Jazz	24
Play/Pause	05	Tuning Down	15	Rock	25
Search/Next	06	Tuning Up	16	Pop	26
CD Open/Close	07	Preset Down	17	Classic	27
Program (TU)	08	Preset Up	18	HSD	28
Band	09	Power/Standby	19	any RC keys	RC
RDS Mode	10	Scroll Source	20		

For FW315C/FW340C/FW345C/FW355C/FW365C/FW373C

Key activated	Display	Key activated	Display	Key activated	Display
Stop/Clear	01	RDS Mode	13	Scroll Source	25
Program (CDC)	02	Clock Set	14	Incredible Stereo	26
Shuffle	03	Timer Set	15	Dbb	27
Search/Prev	04	Timer On/Off	16	Optimal	28
Play/Pause	05	Demo	17	Jazz	29
Search/Next	06	Volume Up	18	Rock	30
Disc 1	07	Volume Down	19	Pop	31
Disc 2	08	Tuning Down	20	Classic	32
Disc 3	09	Tuning Up	21	HSD	33
CD Open Close	10	Preset Down	22	any RC keys	RC
Program (TU)	11	Preset Up	23		
Band	12	Power/Standby	24		

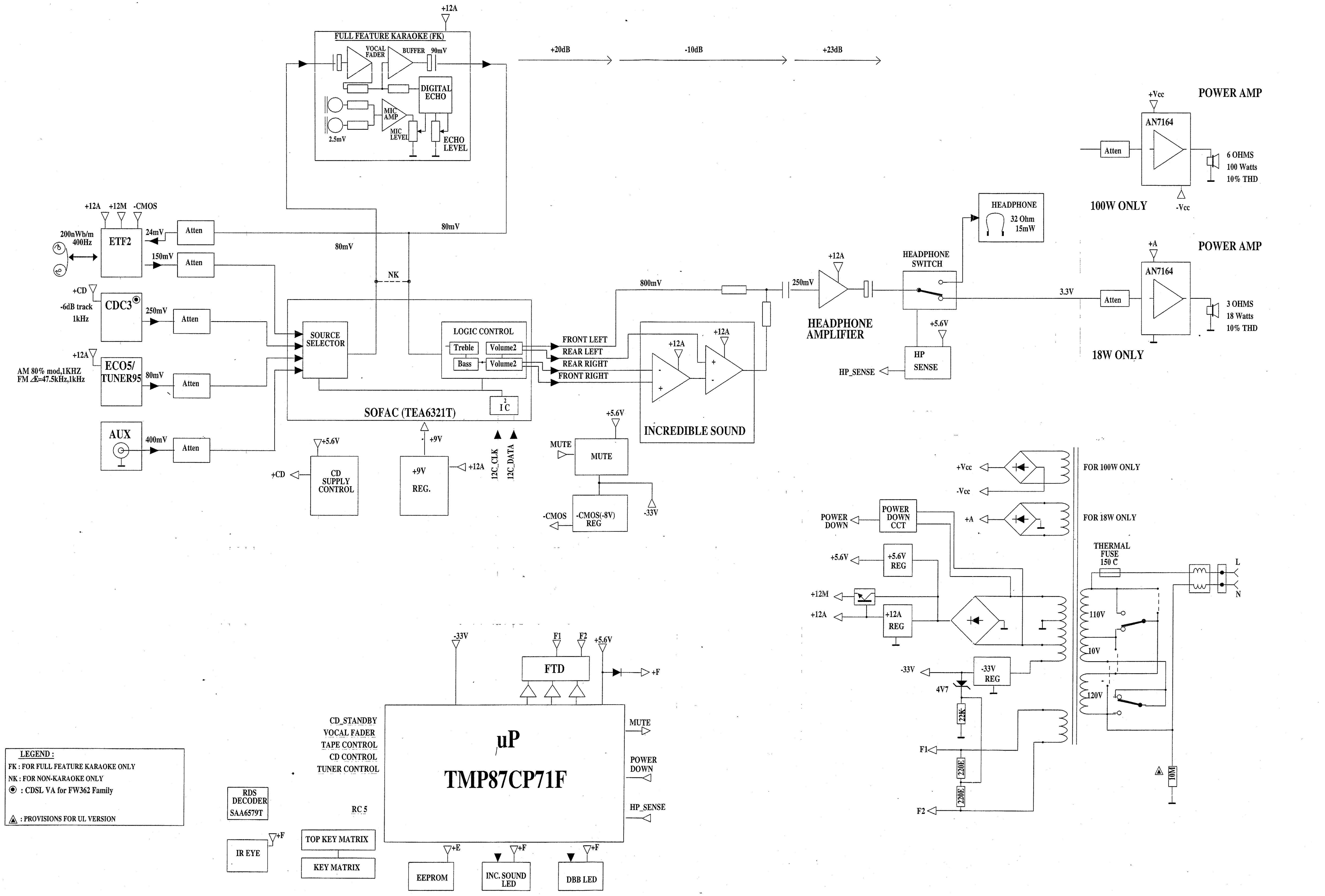

To start service test program hold Program & Preset Up depressed while plugging in the mains cord
Display shows set version and number of ROM version "S yy xxxxxx" (Main menu)
PLAY/PAUSE Button pressed?
N
Y
Motor Test
Display shows CD TEST
Disc Motor
PROGRAM Button pressed?
N
Y
Disc Motor turns CCW Display shows STOP
SHUFFLE Button pressed?
Y
Disc Motor turns CW Display shows PLAY
N
PLAY Button pressed?
Y
Slide Motor
NEXT Button pressed?
N
Y
Slide moves outside Display shows SLD 0
PREV Button pressed?
Y
Slide moves inside Display shows SLD 1
Focus Servo Test
Display shows FOC x
FOC 0 = Focus not found
FOC 1 = Focus found
N
FOCUS found?
Y
STOP Button pressed?
N
Y
Display shows FOC 0
Display shows FOC 1
N
PLAY Button pressed?
Y
STOP Button pressed?
N
Y
Disc Servo Test
Display shows DISC xxx
DISC SLW = too slow
DISC FST = too fast
DISC OK = speed correct
N
PLAY Button pressed?
Y
STOP Button pressed?
N
Y
Radial Servo Test
Display shows RDL
N
PLAY Button pressed?
Y
STOP Button pressed?
N
Y

1) S stands for Service Testprogram

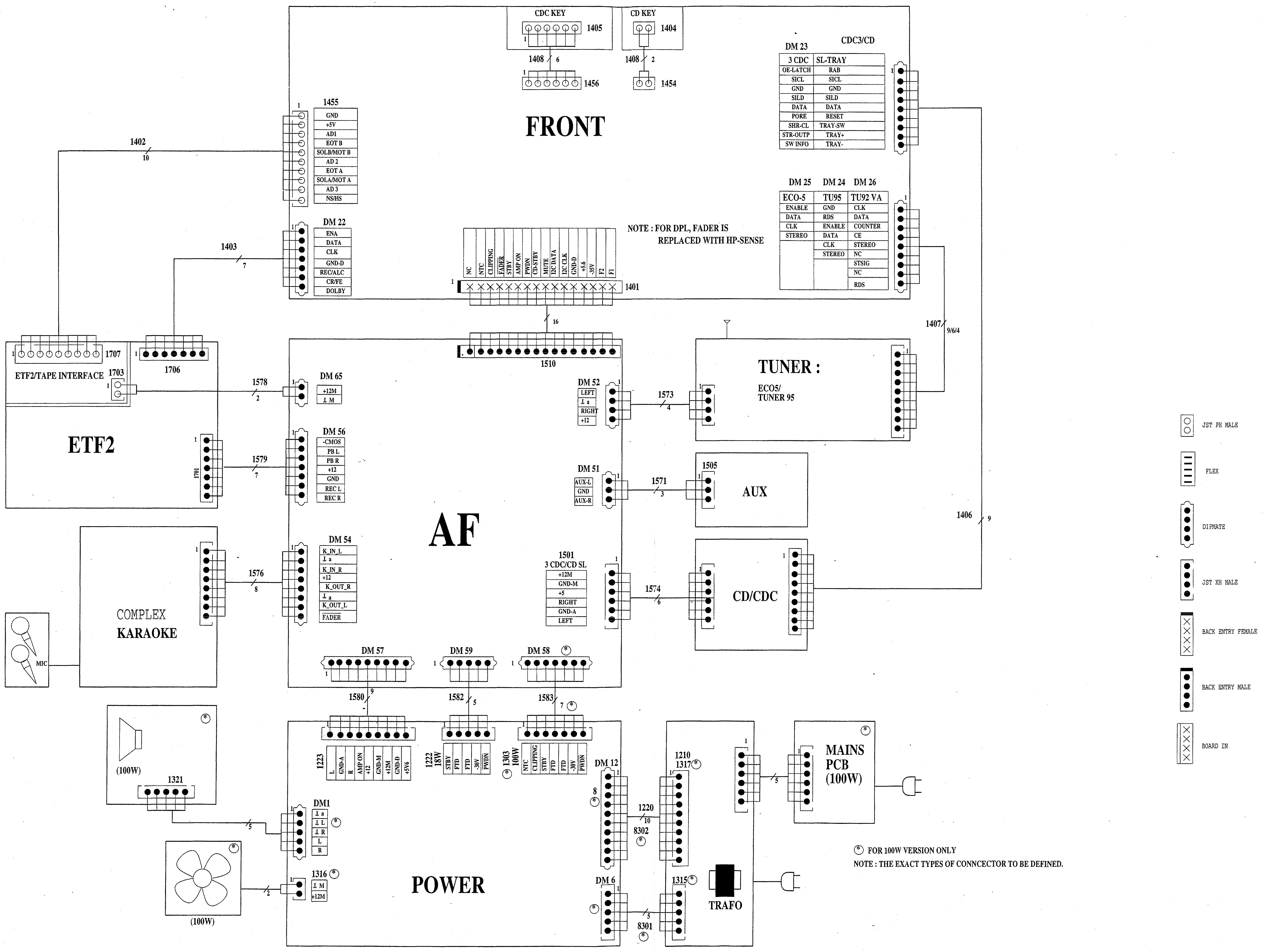
yy stands for software version number of µP on Front Board (counted from 01 upwards)

xxxxxx model number

BLOCK DIAGRAM


+12A
FULL FEATURE KARAOKE (FK)
VOCAL FADER
BUFFER
90mV
DIGITAL ECHO
MIC AMP
MIC LEVEL
ECHO LEVEL
2.5mV
+20dB
-10dB
+23dB
POWER AMP
+Vcc
AN7164
Atten
6 OHMS
100 Watts
10% THD
100W ONLY
-Vcc
+12A
+12M
-CMOS
200nWb/m
400Hz
ETF2
24mV
Atten
150mV
Atten
80mV
80mV
NK
+CD
-6dB track
1kHz
CDC3
250mV
Atten
+12A
AM 80% mod,1KHZ
FM Æ=47.5kHz,1kHz
ECO5/ TUNER95
80mV
Atten
AUX
400mV
Atten
SOURCE SELECTOR
LOGIC CONTROL
Treble
Volume2
Bass
Volume2
I2C
SOFAC (TEA6321T)
+9V
12C_CLK
12C_DATA
FRONT LEFT
REAR LEFT
REAR RIGHT
FRONT RIGHT
800mV
+12A
+12A
INCREDIBLE SOUND
+12A
250mV
HEADPHONE AMPLIFIER
HEADPHONE
32 Ohm
15mW
HEADPHONE SWITCH
+5.6V
HP SENSE
HP_SENSE
3.3V
+A
AN7164
Atten
POWER AMP
3 OHMS
18 Watts
10% THD
18W ONLY
+5.6V
+CD
CD SUPPLY CONTROL
+9V REG.
+12A
+5.6V
MUTE
MUTE
-CMOS
-CMOS(-8V) REG
-33V
+Vcc
-Vcc
FOR 100W ONLY
+A
FOR 18W ONLY
POWER DOWN
POWER DOWN CCT
+5.6V
+5.6V REG
+12M
+12A
+12A REG
THERMAL FUSE 150 C
L
N
110V
10V
120V
-33V
-33V REG
4V7
22K
F1
220E
220E
F2
10M
-33V
F1
F2
+5.6V
FTD
+F
CD_STANDBY
VOCAL FADER
TAPE CONTROL
CD CONTROL
TUNER CONTROL
uP
TMP87CP71F
MUTE
POWER DOWN
HP_SENSE
RC 5
RDS DECODER SAA6579T
+F
IR EYE
TOP KEY MATRIX
KEY MATRIX
+E
EEPROM
+F
INC. SOUND LED
+F
DBB LED
LEGEND :
FK : FOR FULL FEATURE KARAOKE ONLY
NK : FOR NON-KARAOKE ONLY
◉ : CDSL VA for FW362 Family
⚠ : PROVISIONS FOR UL VERSION

WIRING DIAGRAM


FRONT
CDC KEY
1405
CD KEY
1404
1408 6
1408 2
1456
1454
1455
GND
+5V
AD1
EOT B
SOLB/MOT B
AD 2
EOT A
SOLA/MOT A
AD 3
NS/HS
1402 10
DM 22
ENA
DATA
CLK
GND-D
REC/ALC
CR/FE
DOLBY
1403 7
NC
NTC
CLIPPING
FADER
STBY
AMP ON
PWDN
CD-STBY
MUTE
I2C DATA
I2C CLK
GND-D
+5.6
-35V
F2
F1
1401
16
NOTE : FOR DPL, FADER IS REPLACED WITH HP-SENSE
DM 23
CDC3/CD
3 CDC
SL-TRAY
OE-LATCH
RAB
SICL
SICL
GND
GND
SILD
SILD
DATA
DATA
PORE
RESET
SHR-CL
TRAY-SW
STR-OUTP
TRAY+
SW INFO
TRAY-
DM 25
DM 24
DM 26
ECO-5
TU95
TU92 VA
ENABLE
GND
CLK
DATA
RDS
DATA
CLK
ENABLE
COUNTER
STEREO
DATA
CE
CLK
STEREO
STEREO
NC
STSIG
NC
RDS
1407 9/6/4
1406 9
ETF2/TAPE INTERFACE
1707
1706
1703
ETF2
1701
1578 2
1579 7
COMPLEX KARAOKE
MIC
1576 8
AF
1510
DM 65
+12M
⊥ M
DM 56
-CMOS
PB L
PB R
+12
GND
REC L
REC R
DM 54
K_IN_L
⊥ a
K_IN_R
+12
K_OUT_R
⊥ a
K_OUT_L
FADER
DM 52
LEFT
⊥ a
RIGHT
+12
DM 51
AUX-L
GND
AUX-R
1501
3 CDC/CD SL
+12M
GND-M
+5
RIGHT
GND-A
LEFT
DM 57
DM 59
DM 58 ®
TUNER :
ECO5/ TUNER 95
1573 4
AUX
1505
1571 3
CD/CDC
1574 6
1580 9
1582 5
1583 7 ®
(100W)
1321
5
(100W)
2
POWER
1223
L
GND-A
R
AMP ON
+12
GND-M
+12M
GND-D
+5V6
1222 18W
STBY
FTD
FTD
-30V
PWDN
1303 100W
NTC
CLIPPING
STBY
FTD
FTD
-30V
PWDN
DM1
⊥ a
⊥ L
⊥ R
L
R
1316
⊥ M
+12M
DM 12
8
1220 10
8302
DM 6
8301
5
1210
1317
1315
TRAFO
MAINS PCB (100W)
5
JST PH MALE
FLEX
DIPMATE
JST XH MALE
BACK ENTRY FEMALE
BACK ENTRY MALE
BOARD IN

® FOR 100W VERSION ONLY

NOTE : THE EXACT TYPES OF CONNCECTOR TO BE DEFINED.

FRONT BOARD

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6 - 1

22	C	4
23	B	7
24	C	1
1400	B	3
1401	D	5
1404	A	1
1405	A	1
1411	C	7
1412	D	7
1413	C	6
1414	D	6
1415	B	6
1416	D	6
1417	B	5
1418	B	5
1419	B	2
1420	B	2
1421	D	2
1422	D	2
1423	D	1
1424	B	1
1425	D	3
1426	D	3
1427	C	2
1428	C	3
1429	C	4
1430	C	4
1431	D	5
1432	D	4
1433	D	5
1441	A	7
1442	A	6
1443	A	7
1444	A	6
1454	A	1
1455	D	3
1456	A	1
1458	B	7
1460	D	3
1461	D	2
2401	C	4
2402	C	5
2403	C	2
2425	A	1
2426	A	5
2438	B	7
2439	D	2
2440	D	3
2441	C	2
2453	C	1
2454	B	1
2459	B	7
3403	B	4
3404	B	4
3437	C	7
3445	B	2
3446	C	3
3447	C	3
3448	C	3
3450	B	3
3451	B	3
3452	B	3
3453	B	3
3454	B	3
3479	D	5
3513	D	5
3527	D	6
3542	D	3
3545	D	3
3580	D	6
3591	B	1
3592	A	5
3594	C	4
3595	C	3
5401	B	4
5402	C	6
5403	C	2
5406	C	5
5407	C	2
5410	C	6
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6402	C	3
6412	C	5
6413	B	3
6414	B	3
6415	B	3
6416	C	4
6417	C	6
6418	C	6
6419	C	7
6420	C	7
6421	A	6
6422	A	6
6423	A	7
6425	D	4
6445	B	3
6446	B	3
6447	B	3
6448	B	4
6449	B	4
6450	B	3
6451	B	3
6452	B	3
6453	B	3
6454	B	3
6455	B	5
6456	B	5
6457	B	5
6458	B	5
7403	C	2
7428	C	1
9400	B	7
9401	D	4
9402	D	4
9403	C	4
9404	D	6
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9406	C	7
9407	C	6
9408	C	6
9409	D	6
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9415	B	5
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9423	B	5
9424	B	7
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9426	D	5
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9430	B	4
9431	B	4
9432	D	6
9433	B	2
9434	B	1
9435	D	4
9436	C	3
9437	D	4
9438	D	5
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9440	B	4
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9442	C	2
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9450	B	7
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9456	C	7
9457	C	6
9458	C	7
9459	B	6
9460	C	2
9461	B	2
9462	B	2
9463	B	2
9464	B	2
9465	B	2
9466	B	2
9467	C	4
9468	C	3
9469	C	3
9470	C	3
9471	C	3
9472	C	3
9473	C	3
9474	C	2
9475	C	2
9476	C	2
9477	C	2
9478	B	2
9479	B	2
9480	C	3
9481	C	1
9482	C	3
9483	B	1
9484	B	1
9485	C	2
9486	B	2
9487	B	1
9488	C	2
9489	B	1
9490	C	1
9491	C	1
9492	B	5
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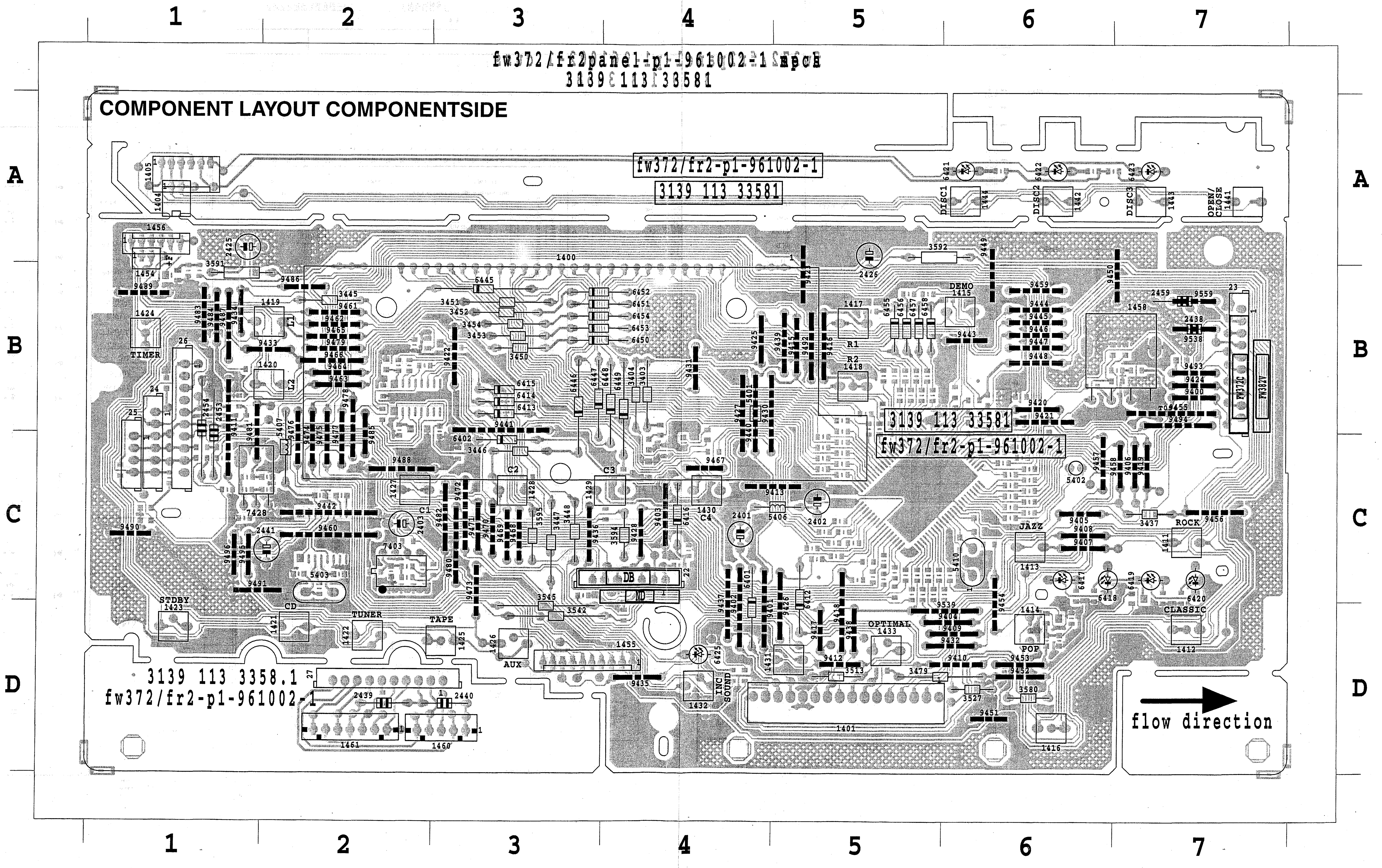
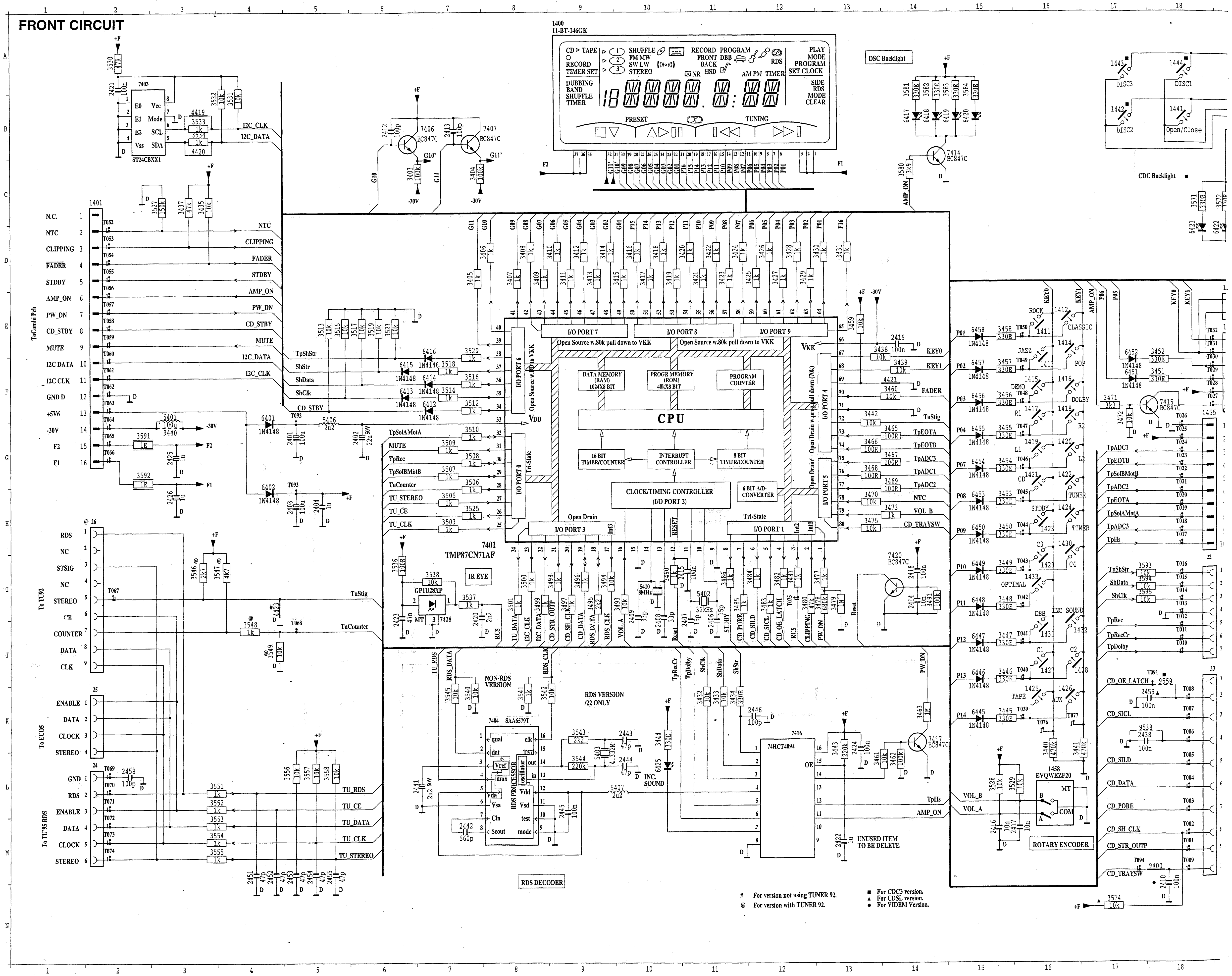
9494	B	7
9495	C	1
9496	C	1
9538	B	7
9539	D	6
9559	B	7

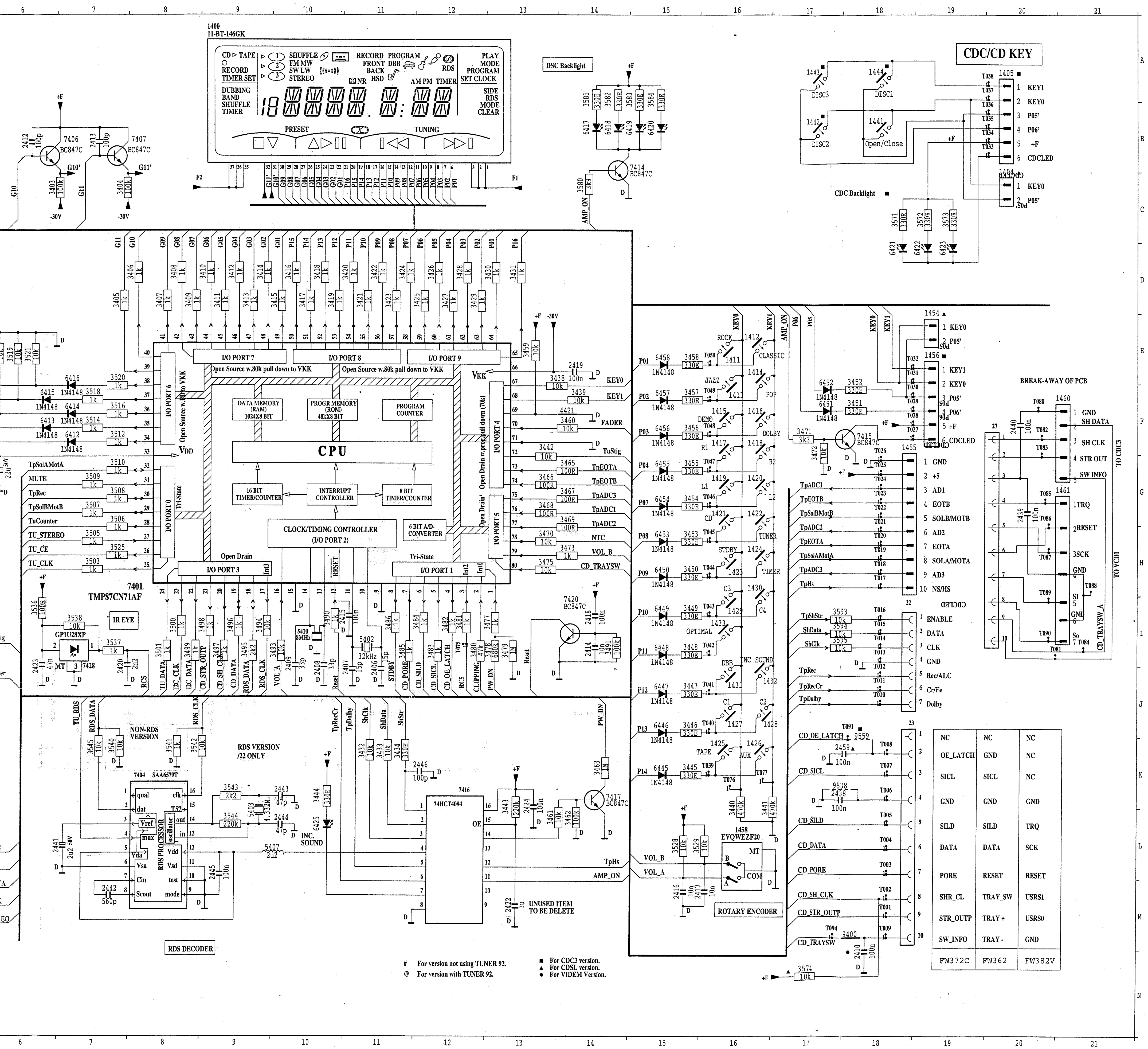

1
2
3
4
5
6
7
A
B
C
D
fw372/fr2panel-p1-961002-1 mpcb
3139 113 33581
COMPONENT LAYOUT COMPONENTSIDE
fw372/fr2-p1-961002-1
3139 113 33581
DISC1
DISC2
DISC3
OPEN/CLOSE
DEMO
TIMER
STDBY
CD
TUNER
TAPE
AUX
INC SOUND
OPTIMAL
JAZZ
ROCK
CLASSIC
POP
R1
R2
C1
C2
C3
C4
L1
L2
DB
ND
3139 113 3358.1
fw372/fr2-p1-961002-1
flow direction

FRONT CIRCUIT


1400
11-BT-146GK
7403
ST24CBXX1
I2C_CLK
I2C_DATA
7406
BC847C
7407
BC847C
G10'
G11'
-30V
F2
F1
DSC Backlight
7414
BC847C
AMP_ON
DISC3
DISC1
DISC2
Open/Close
CDC Backlight
1401
N.C.
NTC
CLIPPING
FADER
STDBY
AMP_ON
PW_DN
CD_STBY
MUTE
I2C DATA
I2C CLK
GND D
+5V6
-30V
To Combi Pcb
TpShStr
ShStr
ShData
ShClk
CD_STBY
TpSolAMotA
MUTE
TpRec
TpSolBMotB
TuCounter
TU_STEREO
TU_CE
TU_CLK
I/O PORT 7
I/O PORT 8
I/O PORT 9
I/O PORT 6
I/O PORT 0
I/O PORT 4
I/O PORT 5
I/O PORT 3
I/O PORT 1
Open Source w.80k pull down to VKK
DATA MEMORY (RAM) 1024X8 BIT
PROGR MEMORY (ROM) 48KX8 BIT
PROGRAM COUNTER
CPU
16 BIT TIMER/COUNTER
INTERRUPT CONTROLLER
8 BIT TIMER/COUNTER
CLOCK/TIMING CONTROLLER (I/O PORT 2)
6 BIT A/D-CONVERTER
Open Drain
Tri-State
7401
TMP87CN71AF
IR EYE
GP1U28XP
KEY0
KEY1
FADER
TuStig
TpEOTA
TpEOTB
TpADC3
TpADC1
TpADC2
NTC
VOL_B
CD_TRAYSW
7420
BC847C
Reset
RDS
NC
STSIG
STEREO
CE
COUNTER
DATA
CLK
To TU92
TuStig
TuCounter
ENABLE
CLOCK
To ECO5
GND
To TU95 RDS
TU_RDS
TU_CE
TU_DATA
TU_CLK
TU_STEREO
NON-RDS VERSION
RDS VERSION /22 ONLY
7404 SAA6579T
RDS PROCESSOR
RDS DECODER
INC. SOUND
7416
74HCT4094
OE
7417
BC847C
TpHs
AMP_ON
UNUSED ITEM TO BE DELETE
ROCK
CLASSIC
JAZZ
POP
DEMO
DOLBY
R1
R2
L1
L2
CD
TUNER
STDBY
TIMER
C3
C4
OPTIMAL
DBB
INC SOUND
C1
C2
TAPE
AUX
1458
EVQWEZF20
ROTARY ENCODER
VOL_B
VOL_A
7415
BC847C
TpADC1
TpEOTB
TpSolBMotB
TpADC2
TpEOTA
TpSolAMotA
TpADC3
TpHs
TpShStr
ShData
ShClk
TpRec
TpRecCr
TpDolby
CD_OE_LATCH
CD_SICL
CD_SILD
CD_DATA
CD_PORE
CD_SH_CLK
CD_STR_OUTP
CD_TRAYSW

For version not using TUNER 92.
@ For version with TUNER 92.

■ For CDC3 version.
▲ For CDSL version.
● For VIDEM Version.


1400
11-BT-146GK
CD▷ TAPE
SHUFFLE
FM MW
SW LW
STEREO
RECORD
TIMER SET
RECORD PROGRAM
FRONT DBB
BACK
NR
HSD
RDS
AM PM TIMER
PLAY
MODE
PROGRAM
SET CLOCK
DUBBING
BAND
SHUFFLE
TIMER
SIDE
RDS
MODE
CLEAR
PRESET
TUNING
F1
F2
DSC Backlight
CDC/CD KEY
DISC3
DISC1
DISC2
Open/Close
KEY1
KEY0
P05'
P06'
+F
CDCLED
CDC Backlight
7401
TMP87CN71AF
I/O PORT 7
I/O PORT 8
I/O PORT 9
Open Source w.80k pull down to VKK
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6 BIT A/D-CONVERTER
I/O PORT 6
I/O PORT 0
I/O PORT 3
I/O PORT 1
I/O PORT 4
I/O PORT 5
Open Drain
Tri-State
VKK
VDD
IR EYE
GP1U28XP
7404 SAA6579T
RDS PROCESSOR
NON-RDS VERSION
RDS VERSION /22 ONLY
RDS DECODER
7416 74HCT4094
UNUSED ITEM TO BE DELETE
INC. SOUND
1458 EVQWEZF20
ROTARY ENCODER
BREAK-AWAY OF PCB
TO CDC3
TO VCD1
ROCK
CLASSIC
JAZZ
POP
DEMO
DOLBY
R1
R2
CD
L1
L2
TUNER
STDBY
TIMER
C3
C4
OPTIMAL
DBB
INC SOUND
C1
C2
TAPE
AUX
GND
+5
AD1
EOTB
SOLB/MOTB
AD2
EOTA
SOLA/MOTA
AD3
NS/HS
ENABLE
DATA
CLK
Rec/ALC
Cr/Fe
Dolby
SH DATA
SH CLK
STR OUT
SW INFO
TRQ
RESET
SCK

NC	NC	NC
OE_LATCH	GND	NC
SICL	SICL	NC
GND	GND	GND
SILD	SILD	TRQ
DATA	DATA	SCK
PORE	RESET	RESET
SHR_CL	TRAY_SW	USRS1
STR_OUTP	TRAY +	USRS0
SW_INFO	TRAY -	GND
FW372C	FW362	FW382V

- # For version not using TUNER 92.
- @ For version with TUNER 92.
- ■ For CDC3 version.
- ▲ For CDSL version.
- ● For VIDEM Version.

1400	A 9	3478	I13
1401	C 2	3479	I13
1404	C20	3480	I12
1405	A20	3481	I12
1411	E16	3482	I12
1412	E16	3483	I12
1413	F16	3484	I12
1414	E16	3485	I11
1415	F16	3486	I11
1416	F16	3490	I10
1417	F16	3491	I14
1418	F16	3493	I10
1419	G16	3494	I 9
1420	G16	3495	I 9
1421	G16	3496	I 9
1422	G16	3497	I 9
1423	H16	3498	I 9
1424	H16	3499	I 8
1425	K16	3500	I 8
1426	K16	3501	I 8
1427	J16	3503	H 7
1428	J16	3505	H 7
1429	I16	3506	G 7
1430	H16	3507	G 7
1431	J16	3508	G 7
1432	J16	3509	G 7
1433	I16	3510	G 7
1441	B18	3512	F 7
1442	B17	3513	E 5
1443	A17	3514	F 7
1444	A18	3515	E 5
1454	E19	3516	F 7
1455	F19	3517	E 6
1456	E19	3518	F 7
1458	L16	3519	E 6
1460	F20	3520	E 7
1461	G20	3521	E 6
22	I18	3525	H 7
23	J18	3527	C 3
24	L 2	3528	L15
2401	G 5	3529	L15
2402	G 6	3530	A 2
2403	H 5	3531	B 4
2404	H 5	3532	B 3
2406	J11	3533	B 3
2407	J11	3534	B 3
2408	J10	3536	I 6
2409	I10	3537	I 7
2410	N18	3538	I 7
2412	B 6	3540	K 7
2413	B 7	3541	K 8
2414	I14	3542	K 8
2415	I11	3543	K 9
2416	M15	3544	L 9
2417	M15	3545	K 7
2418	I14	3546	I 3
2419	E14	3547	I 3
2420	I 7	3548	J 4
2421	A 2	3549	J 4
2422	M13	3551	L 3
2423	I 6	3552	L 3
2424	K13	3553	M 3
2425	G 3	3554	M 3
2426	H 3	3555	M 3
2438	K17	3556	L 4
2439	G20	3557	L 5
2440	F20	3558	L 5
2441	L 7	3571	C18
2442	M 7	3572	C19
2443	K10	3573	C19
2444	L10	3574	N17
2445	L 9	3580	C14
2446	K12	3581	A14
2451	M 4	3582	A14
2452	M 4	3583	A14
2453	M 5	3584	A15
2454	M 5	3591	G 2
2455	M 5	3592	G 2
2458	L 2	3593	I17
2459	K18	3594	I17
25	K 2	3595	I17
26	H 2	4419	B 3
27	F20	4420	B 3
3403	C 6	4421	F14
3404	C 7	4423	I 4
3405	D 7	5401	F 3
3406	D 8	5402	I11
3407	D 8	5403	L 9
3408	D 8	5406	F 5
3409	D 8	5407	L10
3410	D 9	5410	I10
3411	D 9	6401	F 4
3412	D 9	6402	H 4
3413	D 9	6412	F 7
3414	D 9	6413	F 6
3415	D10	6414	F 7
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3417	D10	6416	E 7
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3419	D10	6418	B14
3420	D11	6419	B14
3421	D11	6420	B15
3422	D11	6421	D18
3423	D11	6422	D19
3424	D11	6423	D19
3425	D12	6425	L10
3426	D12	6445	K15
3427	D12	6446	J15
3428	D12	6447	J15
3429	D12	6448	I15
3430	D13	6449	I15
3431	D13	6450	H15
3432	K11	6451	F17
3433	K11	6452	F17
3434	K11	6453	H15
3435	C 3	6454	G15
3437	C 3	6455	G15
3438	E13	6456	F15
3439	F14	6457	F15
3440	K16	6458	E15
3441	K16	7401	H 8
3442	F13	7403	A 2
3443	K13	7404	K 8
3444	K10	7406	B 7
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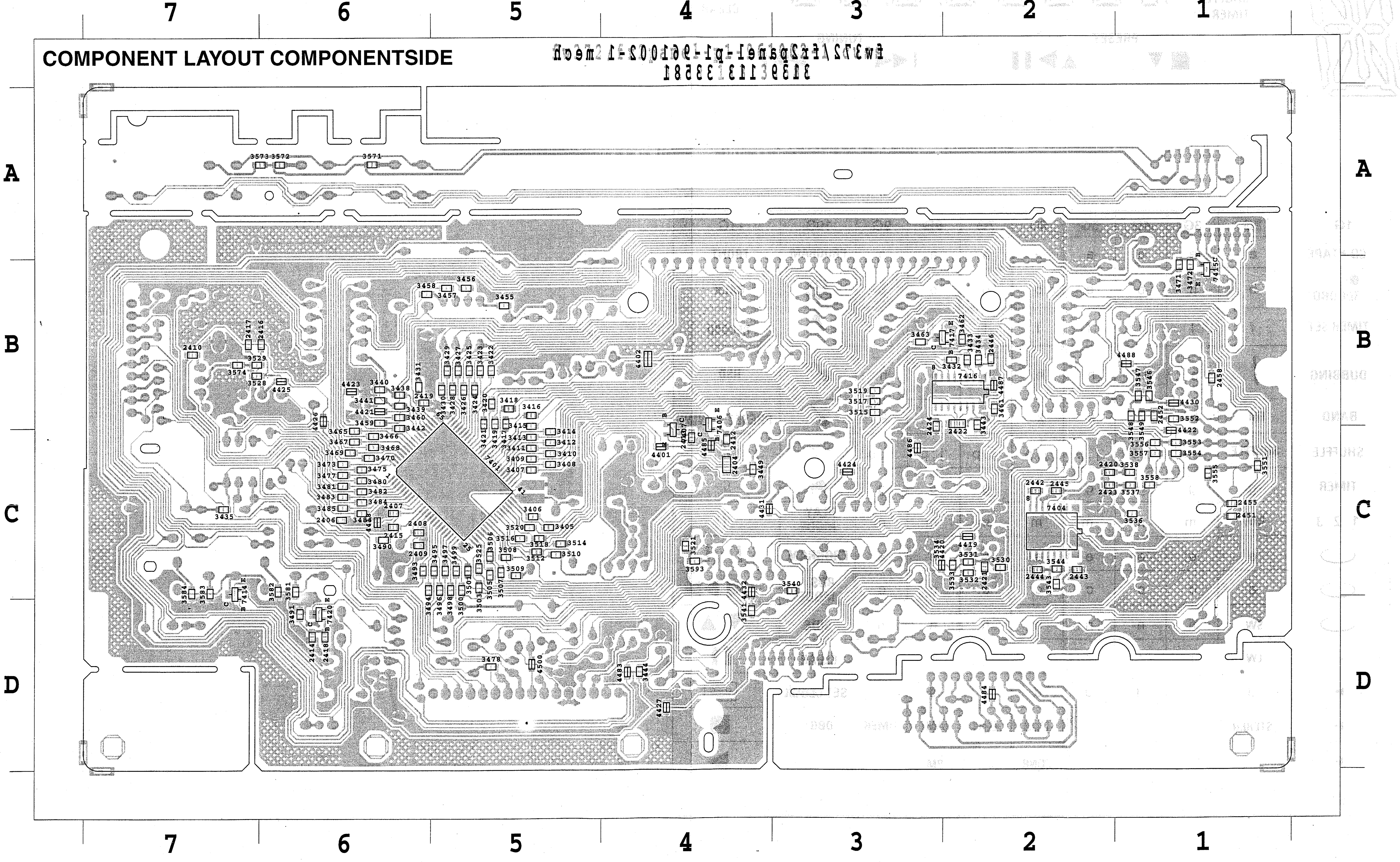
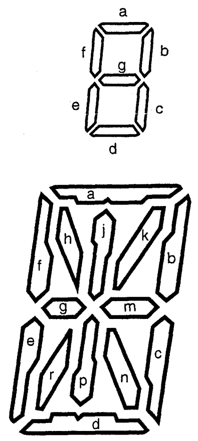
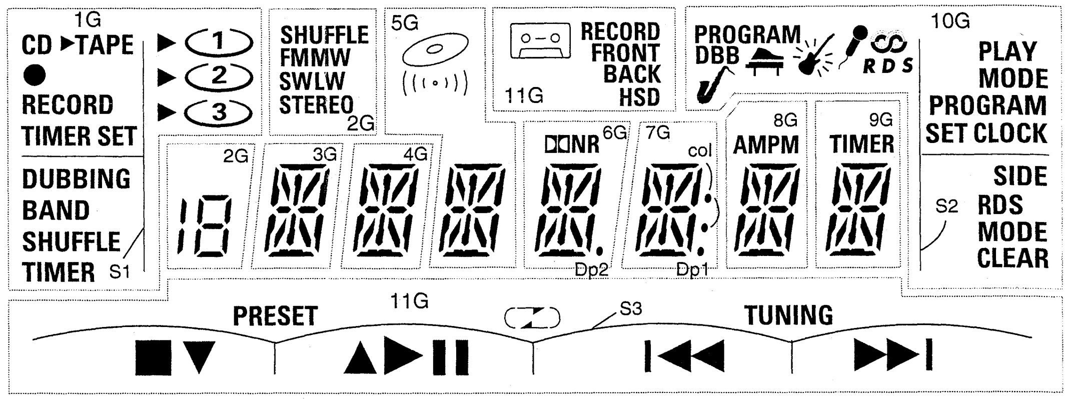
3446	J15	7414	B14
3447	J15	7415	F18
3448	I15	7416	K12
3449	I15	7417	K14
3450	H15	7420	I14
3451	F18	7428	J 7
3452	E18	9400	M18
3453	H15	9440	G 3
3454	G15	9538	K17
3455	G15	9559	K18
3456	F15		
3457	F15		
3458	E15		
3459	E13		
3460	F14		
3461	L13		
3462	L14		
3463	K14		
3465	G14		
3466	G13		
3467	G14		
3468	G13		
3469	G14		
3470	H13		
3471	F17		
3472	F17		
3473	H14		
3475	H13		
3477	I13		

2404 C 4	2416 B 6	2443 C 2	3407 C 5	3417 B 5	3427 B 5	3439 B 6	3458 B 6	3469 C 6	3482 C 6	3496 C 5	3508 C 5	3520 C 5	3536 C 1	3549 B 1	3572 A 6	4418 C 6	4430 B 1	7401 C 5
2406 C 6	2417 B 7	2444 C 2	3408 C 5	3418 B 5	3428 B 5	3440 B 6	3459 B 6	3470 C 6	3483 C 6	3497 C 5	3509 C 5	3521 C 4	3537 C 1	3551 C 1	3573 A 6	4419 C 2	4431 C 4	7404 C 2
2407 C 6	2418 D 6	2445 C 2	3409 C 5	3419 B 5	3429 B 5	3441 B 6	3460 B 6	3471 B 1	3484 C 6	3498 C 5	3510 C 5	3525 C 5	3538 C 1	3552 B 1	3574 B 7	4420 C 3	4432 C 4	7406 B 4
2408 C 6	2419 B 6	2446 B 2	3410 C 5	3420 B 5	3430 B 5	3442 C 6	3461 B 2	3472 B 1	3485 C 6	3499 C 5	3512 C 5	3528 B 7	3540 C 3	3553 C 1	3581 C 6	4421 B 6	4483 D 4	7407 C 4
2409 C 6	2420 C 2	2451 C 1	3411 C 5	3421 B 5	3431 B 6	3443 B 2	3462 B 2	3473 C 6	3486 C 6	3500 C 5	3514 C 5	3529 B 7	3541 D 4	3554 C 1	3582 C 6	4422 C 1	4484 D 2	7414 C 7
2410 B 7	2421 C 2	2452 B 1	3412 C 5	3422 B 5	3432 B 2	3444 D 4	3463 B 3	3475 C 6	3490 C 6	3501 C 5	3515 B 3	3530 C 2	3543 C 2	3555 C 1	3583 C 7	4423 B 6	4485 C 4	7415 B 1
2412 C 4	2422 B 2	2455 C 1	3413 C 5	3423 B 5	3433 B 2	3449 C 4	3465 C 6	3477 C 6	3491 D 6	3503 C 5	3516 C 5	3531 C 2	3544 C 2	3556 C 1	3584 C 7	4424 C 3	4486 C 3	7416 B 2
2413 C 4	2423 C 2	2458 B 1	3414 C 5	3424 B 5	3434 B 2	3455 B 5	3466 C 6	3478 D 5	3493 C 6	3505 C 5	3517 B 3	3532 C 2	3546 B 1	3557 C 1	3593 C 4	4425 B 6	4487 B 2	7417 B 3
2414 D 6	2424 B 3	3405 C 5	3415 B 5	3425 B 5	3435 C 7	3456 B 5	3467 C 6	3480 C 6	3494 C 6	3506 C 5	3518 C 5	3533 C 2	3547 B 1	3558 C 1	4401 C 4	4426 B 6	4488 B 1	7420 D 6
2415 C 6	2442 C 2	3406 C 5	3416 B 5	3426 B 5	3438 B 6	3457 B 5	3468 C 6	3481 C 6	3495 C 5	3507 C 5	3519 B 3	3534 C 3	3548 B 1	3571 A 6	4402 B 4	4427 D 4	4500 D 5	----

COMPONENT LAYOUT COMPONENTSIDE




a
b
c
d
e
f
g
a
b
c
d
e
f
g
h
j
k
m
n
p
r


1G
CD ▶TAPE
●
RECORD
TIMER SET
DUBBING
BAND
SHUFFLE
TIMER
S1
▶ 1
▶ 2
▶ 3
SHUFFLE
FMMW
SWLW
STEREO
2G
5G
RECORD
FRONT
BACK
HSD
11G
PROGRAM
DBB
RDS
10G
PLAY
MODE
PROGRAM
SET CLOCK
2G
3G
4G
DDNR
6G
7G
col
8G
AMPM
9G
TIMER
SIDE
S2
RDS
MODE
CLEAR
Dp2
Dp1
PRESET
11G
S3
TUNING
■▼
▲▶❚❚
|◀◀
▶▶|

	1G	2G	3G	4G	5G	6G	7G	8G	9G	10G	11G
P1	CD ▶TAPE	a	a	a	a	a	a	a	a	PROGRAM	FRONT
P2	● RECORD	b	b	b	b	b	b	b	b	RDS	BACK
P3	TIMER SET	f	f	f	f	f	f	f	f	🎤	RECORD
P4	DUBBING	|	h	h	h	h	h	h	h	🎷	HSD
P5	BAND	FM	k	k	k	k	k	k	k	🎸	PRESET TUNING
P6	SHUFFLE	SHUFFLE	j , p	j , p	j , p	j , p	j , p	j , p	j , p	✨	Z
P7	TIMER	g	g	g	g	g	g	g	g	🎹	
P8	1 2 3	MW	m	m	m	m	m	m	m	PLAY MODE	
P9	⊂⊃	e	e	e	e	e	e	e	e	PROGRAM	I I
P10	⊂⊃	c	c	c	c	c	c	c	c	RDS MODE	◀◀ ▶▶
P11	⊂⊃	SW	n	n	n	n	n	n	n	SIDE	▼ ▲
P12		LW	r	r	r	r	r	r	r	CLEAR	❚❚
P13	▶	d	d	d	d	d	d	d	d	SET CLOCK	📼
P14	▶	STEREO	-	-	💿	Dp2	Dp1	AM	TIMER	DBB	■
P15	▶	-	-	-	((•))	DDNR	col	PM	-	-	▶
P16	S1	-	-	-	-	-	-	-	-	S2	S3

FRONT BOARD PARTSLIST

MISCELLANEOUS

17	4822 256 10206	Holder Led
18	4822 466 10972	Light Guide CDC
1400	4822 135 00033	Display Fluorescent
1401	4822 267 51238	Connector
1411	4822 276 13114	Tact switch
1412	4822 276 13114	Tact switch
1413	4822 276 13114	Tact switch
1414	4822 276 13114	Tact switch
1415	4822 276 13114	Tact switch
1416	4822 276 13114	Tact switch
1417	4822 276 13114	Tact switch
1418	4822 276 13114	Tact switch
1419	4822 276 13114	Tact switch
1420	4822 276 13114	Tact switch
1421	4822 276 13114	Tact switch
1422	4822 276 13114	Tact switch
1423	4822 276 13114	Tact switch
1424	4822 276 13114	Tact switch
1425	4822 276 13114	Tact switch
1426	4822 276 13114	Tact switch
1427	4822 276 13114	Tact switch
1428	4822 276 13114	Tact switch
1429	4822 276 13114	Tact switch
1430	4822 276 13114	Tact switch
1431	4822 276 13114	Tact switch
1432	4822 276 13114	Tact switch
1433	4822 276 13114	Tact switch
1441	4822 276 13114	Tact switch
1442	4822 276 13114	Tact switch (FW373C)
1443	4822 276 13114	Tact switch (FW373C)
1444	4822 276 13114	Tact switch (FW373C)
1458	4822 101 90254	Variable resistors

CAPACITORS

2401	4822 124 41584	100μF 20% 10V
2402	4822 124 41596	22μF 20% 50V
2403	4822 124 41584	100μF 20% 10V
2404	4822 126 11692	1μF
2406	5322 122 32481	15PF 5% 50V
2407	5322 122 32481	15PF 5% 50V
2408	5322 122 32659	33PF 5% 50V
2409	5322 122 32659	33PF 5% 50V
2412	5322 122 32531	100PF 5% 50V
2413	5322 122 32531	100PF 5% 50V

CAPACITORS

2414	4822 122 33177	10nF 20% 50V
2415	4822 126 12882	100nF+80-20% 50V
2416	4822 122 33177	10nF 20% 50V
2417	4822 122 33177	10nF 20% 50V
2418	4822 126 13838	100nF 20% 50V
2419	4822 126 13838	100nF 20% 50V
2420	4822 122 33175	2.2nF 20% 50V
2421	4822 126 13838	100nF 20% 50V
2422	4822 126 11692	1μF 20% 16V
2423	4822 122 33797	47nF 20% 50V
2424	4822 126 13838	100nF 20% 50V
2425	4822 124 40242	1μF 20% 63V
2426	4822 124 40242	1μF 20% 63V
2438	4822 126 12882	100nF+80-20% 50V
2441	4822 124 41576	2.2μF 20% 50V
2442	4822 122 33173	560PF 10% 50V(Not for -/21)
2443	5322 122 32452	47PF 5% 63V(Not for -/21)
2444	5322 122 32452	47PF 5% 63V(Not for -/21)
2445	4822 126 13838	100nF 20% 50V(Not for -/21)
2446	5322 122 32531	100PF 5% 50V
2451	5322 122 32452	47PF 5% 63V
2452	5322 122 32452	47PF 5% 63V
2453	4822 122 33848	47PF 5% 50V
2454	4822 122 33848	47PF 5% 50V
2455	5322 122 32452	47PF 5% 63V
2458	5322 122 32531	100PF 5% 50V
2459	4822 126 12882	100NF+80-20% 50V (FW363)

RESISTORS

3403	4822 116 52234	100K 5% 0.5W
3404	4822 116 52234	100K 5% 0.5W
3405	4822 051 10102	1k 2% 0.25W
3406	4822 051 10102	1k 2% 0.25W
3407	4822 051 10102	1k 2% 0.25W
3408	4822 051 10102	1k 2% 0.25W
3409	4822 051 10102	1k 2% 0.25W
3410	4822 051 10102	1k 2% 0.25W
3411	4822 051 10102	1k 2% 0.25W
3412	4822 051 10102	1k 2% 0.25W
3413	4822 051 10102	1k 2% 0.25W
3414	4822 051 10102	1k 2% 0.25W
3415	4822 051 10102	1k 2% 0.25W
3416	4822 051 10102	1k 2% 0.25W
3417	4822 051 10102	1k 2% 0.25W

FRONT BOARD PARTSLIST

RESISTORS

3418	4822 051 10102	1k 2% 0.25W
3419	4822 051 10102	1k 2% 0.25W
3420	4822 051 10102	1k 2% 0.25W
3421	4822 051 10102	1k 2% 0.25W
3422	4822 051 10102	1k 2% 0.25W
3423	4822 051 10102	1k 2% 0.25W
3424	4822 051 10102	1k 2% 0.25W
3425	4822 051 10102	1k 2% 0.25W
3426	4822 051 10102	1k 2% 0.25W
3427	4822 051 10102	1k 2% 0.25W
3428	4822 051 10102	1k 2% 0.25W
3429	4822 051 10102	1k 2% 0.25W
3430	4822 051 10102	1k 2% 0.25W
3431	4822 051 10102	1k 2% 0.25W
3432	4822 051 20331	330Ω 5% 0.1W
3433	4822 051 20331	330Ω 5% 0.1W
3434	4822 051 20331	330Ω 5% 0.1W
3435	4822 051 20103	10k 5% 0.1W
3437	4822 116 52284	47K 5% 0.5W
3438	4822 051 20103	10k 5% 0.1W
3439	4822 051 20103	10k 5% 0.1W
3440	4822 051 20474	470k 5% 0.1W
3441	4822 051 20474	470k 5% 0.1W
3442	4822 051 20103	10k 5% 0.1W
3443	4822 051 20224	220k 5% 0.1W
3444	4822 051 20331	330Ω 5% 0.1W
3445	4822 116 52219	330Ω 5% 0.5W
3446	4822 116 52219	330Ω 5% 0.5W
3447	4822 116 52219	330Ω 5% 0.5W
3448	4822 116 52219	330Ω 5% 0.5W
3449	4822 051 20331	330Ω 5% 0.1W
3450	4822 116 52219	330Ω 5% 0.5W
3451	4822 116 52219	330Ω 5% 0.5W
3452	4822 116 52219	330Ω 5% 0.5W
3453	4822 116 52219	330Ω 5% 0.5W
3454	4822 116 52219	330Ω 5% 0.5W
3455	4822 051 20331	330Ω 5% 0.1W
3456	4822 051 20331	330Ω 5% 0.1W
3457	4822 051 20331	330Ω 5% 0.1W
3458	4822 051 20331	330Ω 5% 0.1W

RESISTORS

3459	4822 051 20103	10k 5% 0.1W
3460	4822 051 20103	10k 5% 0.1W
3461	4822 051 20103	10k 5% 0.1W
3462	4822 051 20104	100k 5% 0.1W
3463	4822 051 20105	1M 5% 0.1W
3465	4822 051 20101	100Ω 5% 0.1W
3466	4822 051 20101	100Ω 5% 0.1W
3467	4822 051 20101	100Ω 5% 0.1W
3468	4822 051 20101	100Ω 5% 0.1W
3469	4822 051 20101	100Ω 5% 0.1W
3470	4822 051 20103	10k 5% 0.1W
3471	4822 051 20332	3k3 5% 0.1W
3472	4822 051 20103	10k 5% 0.1W
3473	4822 051 10102	1k 2% 0.25W
3475	4822 051 20103	10k 5% 0.1W
3477	4822 051 10102	1k 2% 0.25W
3478	4822 051 20684	680k 5% 0.1W
3479	4822 116 52235	1M 5% 0.5W
3480	4822 051 20473	47k 5% 0.1W
3481	4822 051 10102	1k 2% 0.25W
3482	4822 051 10102	1k 2% 0.25W
3483	4822 051 10102	1k 2% 0.25W
3484	4822 051 10102	1k 2% 0.25W
3485	4822 051 10102	1k 2% 0.25W
3486	4822 051 10102	1k 2% 0.25W
3490	4822 051 10102	1k 2% 0.25W
3491	4822 051 20104	100k 5% 0.1W
3493	4822 051 20103	10k 5% 0.1W
3494	4822 051 20103	10k 5% 0.1W
3495	4822 117 11449	2K2 1% 0.1W
3496	4822 051 10102	1k 2% 0.25W
3497	4822 051 10102	1k 2% 0.25W
3498	4822 051 10102	1k 2% 0.25W
3499	4822 051 10102	1k 2% 0.25W
3500	4822 051 10102	1k 2% 0.25W
3501	4822 051 10102	1k 2% 0.25W
3503	4822 051 10102	1k 2% 0.25W
3505	4822 051 10102	1k 2% 0.25W
3506	4822 051 10102	1k 2% 0.25W
3507	4822 051 10102	1k 2% 0.25W

FRONT BOARD PARTSLIST

RESISTORS

3508	4822 051 10102	1k 2% 0.25W
3509	4822 051 10102	1k 2% 0.25W
3510	4822 051 10102	1k 2% 0.25W
3512	4822 051 10102	1k 2% 0.25W
3513	4822 116 83864	10k 5% 0.5W
3514	4822 051 10102	1k 2% 0.25W
3515	4822 051 20103	10k 5% 0.1W
3516	4822 051 10102	1k 2% 0.25W
3517	4822 051 20103	10k 5% 0.1W
3518	4822 051 10102	1k 2% 0.25W
3519	4822 051 20103	10k 5% 0.1W
3520	4822 051 10102	1k 2% 0.25W
3521	4822 051 20103	10k 5% 0.1W
3525	4822 051 10102	1k 2% 0.25W
3527	4822 116 52245	150K 5% 0.5W
3528	4822 051 20103	10k 5% 0.1W
3529	4822 051 20103	10k 5% 0.1W
3530	4822 051 20479	47Ω 5% 0.1W
3531	4822 051 20103	10k 5% 0.1W
3532	4822 051 20103	10k 5% 0.1W
3533	4822 051 10102	1k 2% 0.25W
3534	4822 051 10102	1k 2% 0.25W
3536	4822 051 20101	100Ω 5% 0.1W
3537	4822 051 10102	1k 2% 0.25W
3538	4822 051 20103	10k 5% 0.1W
3540	4822 051 20103	10k 5% 0.1W (For -/21 & -/37)
3541	4822 051 10102	1k 2% 0.25W (For -/21 & -/37)
3542	4822 116 83864	10k 5% 0.5W (For -/22 & -/25)
3543	4822 117 11449	2k2 1% 0.1W (For -/22 & -/25)
3544	4822 051 20224	220k 5% 0.1W (For -/22 & -/25)
3545	4822 116 83864	10K 5% 0.5W (For -/22 & -/25)
3551	4822 051 10102	1k 2% 0.25W
3552	4822 051 10102	1k 2% 0.25W
3553	4822 051 10102	1k 2% 0.25W
3554	4822 051 10102	1k 2% 0.25W
3555	4822 051 10102	1k 2% 0.25W
3556	4822 051 20103	10k 5% 0.1W
3557	4822 051 20103	10k 5% 0.1W
3558	4822 051 20103	10k 5% 0.1W
3571	4822 051 20331	330Ω 5% 0.1W (FW373C)

RESISTORS

3572	4822 051 20331	330Ω 5% 0.1W (FW373C)
3573	4822 051 20331	330Ω 5% 0.1W (FW373C)
3574	4822 051 20103	10k 5% 0.1W
3580	4822 116 52276	3K9 5% 0.5W
3581	4822 051 20331	330Ω 5% 0.1W
3582	4822 051 20331	330Ω 5% 0.1W
3583	4822 051 20331	330Ω 5% 0.1W
3584	4822 051 20331	330Ω 5% 0.1W
3591	4822 052 10108	1Ω 5% 0.33W
3592	4822 052 10108	1Ω 5% 0.33W
3593	4822 051 20103	10k 5% 0.1W
3594	4822 116 83864	10K 5% 0.5W
3595	4822 116 83864	10K 5% 0.5W

CHIP JUMPER

4421	4822 051 20008	0Ω Jumper
4422	4822 051 20008	0Ω Jumper
4423	4822 051 20008	0Ω Jumper
4424	4822 051 20008	0Ω Jumper
4425	4822 051 20008	0Ω Jumper
4426	4822 051 20008	0Ω Jumper
4427	4822 051 20008	0Ω Jumper
4430	4822 051 20008	0Ω Jumper
4431	4822 051 20008	0Ω Jumper
4432	4822 051 20008	0Ω Jumper
4483	4822 051 20008	0Ω Jumper
4485	4822 051 20008	0Ω Jumper
4486	4822 051 20008	0Ω Jumper
4487	4822 051 20008	0Ω Jumper
4488	4822 051 20008	0Ω Jumper

COIL & CRYSTAL

5402	4822 242 70938	Crystal (32.768KHZ)
5403	4822 242 72195	Crystal 8MHz(Not for -/21)
5406	4822 156 21721	Coil 2.2µH 10%
5407	4822 156 21721	Coil 2.2µH 10%(Not for -/21)
5410	5322 242 73697	Filter 8MHz

DIODE

6401	4822 130 30621	1N4148
6402	4822 130 30621	1N4148
6412	4822 130 30621	1N4148
6413	4822 130 30621	1N4148
6414	4822 130 30621	1N4148

FRONT BOARD PARTSLIST

DIODE

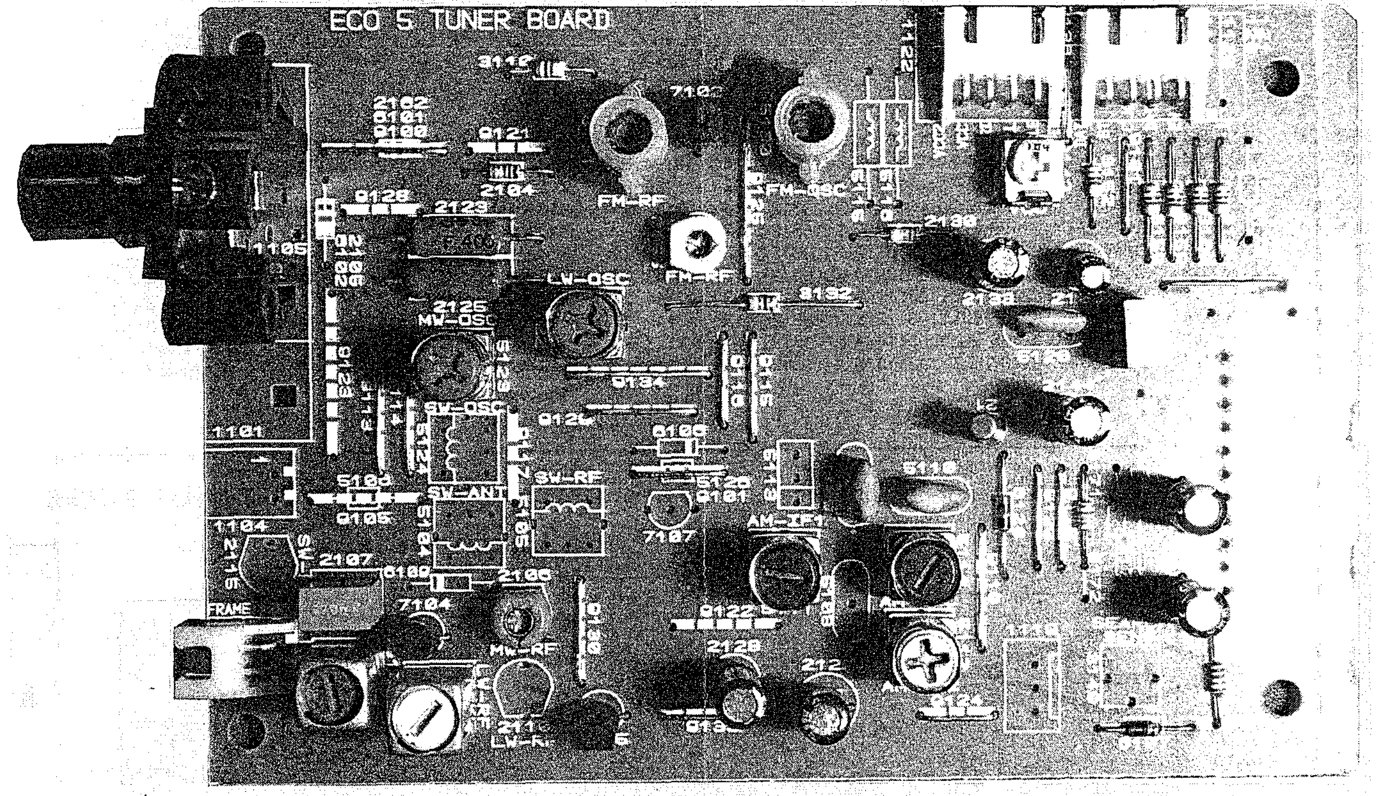
6415	4822 130 30621	1N4148
6416	4822 130 30621	1N4148
6417	4822 130 82978	LTL-16KGE
6418	4822 130 82978	LTL-16KGE
6419	4822 130 82978	LTL-16KGE
6420	4822 130 82978	LTL-16KGE
6421	4822 130 82978	LTL-16KGE (FW373C)
6422	4822 130 82978	LTL-16KGE (FW373C)
6423	4822 130 82978	LTL-16KGE (FW373C)
6425	4822 130 82978	LTL-16KGE
6445	4822 130 30621	1N4148
6446	4822 130 30621	1N4148
6447	4822 130 30621	1N4148
6448	4822 130 30621	1N4148
6449	4822 130 30621	1N4148
6450	4822 130 30621	1N4148
6451	4822 130 30621	1N4148
6452	4822 130 30621	1N4148
6453	4822 130 30621	1N4148
6454	4822 130 30621	1N4148
6455	4822 130 30621	1N4148
6456	4822 130 30621	1N4148
6457	4822 130 30621	1N4148
6458	4822 130 30621	1N4148

INTERGRATED CIRCUIT

7401	4822 209 15441	TMP87CS71F-373S51391 (FW373C)
7401	4822 209 15442	TMP87CS71F-363S51381 (FW363)
7403	4822 209 31508	ST24C01B1
7404	4822 209 31981	SAA6579T/V1
7416	5322 209 12171	74HC4094D
5404	9350 400 70118	IC SAA6579T/VI (Not for -/21)

TRANSISTOR

7406	5322 130 42755	BC847C
7407	5322 130 42755	BC847C
7414	5322 130 42755	BC847C
7415	5322 130 42755	BC847C
7417	5322 130 42755	BC847C
7420	5322 130 42755	BC847C
7428	4822 130 10165	GP1U28XP


ECO 5 TUNER BOARD
FM-RF
FM-OSC
LW-OSC
MW-OSC
SW-OSC
SW-RF
SW-ANT
AM-IF1
MW-RF
FRAME

TUNER BOARD ECO5

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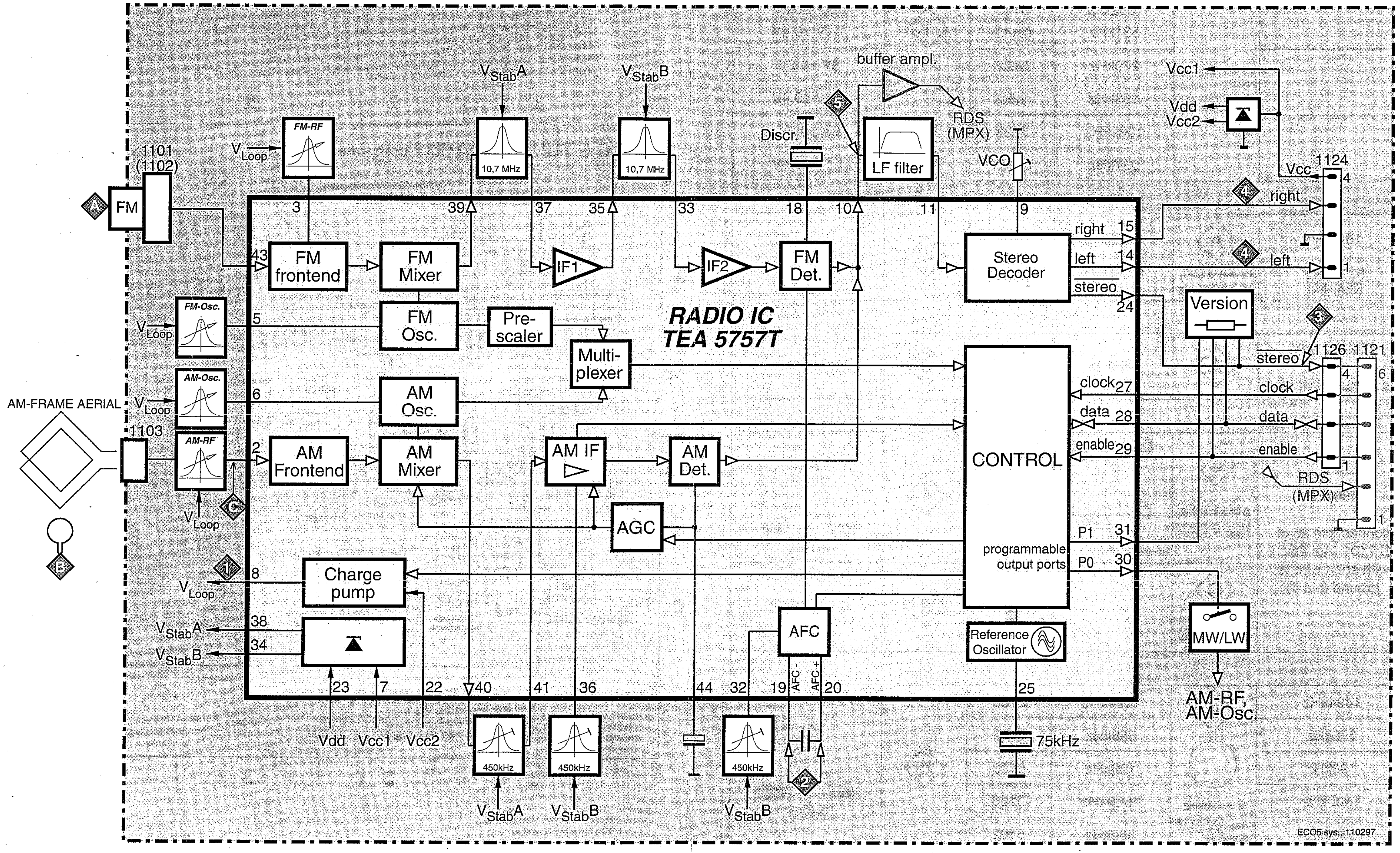
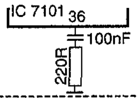
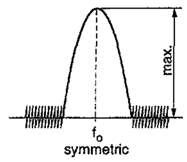
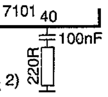
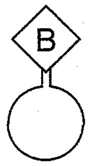
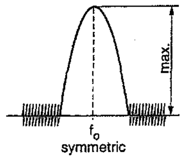
BLOCKDIAGRAM

TUNER BOARD
ECO 5 systems


FM
1101
(1102)
FM-RF
V Loop
VStabA
VStabB
10,7 MHz
10,7 MHz
buffer ampl.
RDS
(MPX)
Discr.
LF filter
VCO
Vcc1
Vdd
Vcc2
Vcc
1124
right
left
FM frontend
FM Mixer
IF1
IF2
FM Det.
Stereo Decoder
right
left
stereo
FM-Osc.
FM Osc.
Pre-scaler
Multi-plexer
RADIO IC
TEA 5757T
Version
stereo
1126
1121
AM-FRAME AERIAL
AM-Osc.
AM Osc.
clock
data
enable
CONTROL
1103
AM-RF
AM Frontend
AM Mixer
AM IF
AM Det.
RDS
(MPX)
AGC
P1
P0
programmable output ports
Charge pump
VLoop
VStabA
VStabB
AFC
AFC -
AFC +
Reference Oscillator
MW/LW
AM-RF,
AM-Osc.
Vdd
Vcc1
Vcc2
450kHz
450kHz
450kHz
75kHz
VStabA
VStabB
VStabB
3
39
37
35
33
18
10
11
9
15
14
24
43
5
6
2
27
28
29
31
30
8
38
34
23
7
22
40
41
36
44
32
19
20
25
4
1
6
A
B
C
1
2
3
4
5
ECO5 sys. 110297

TUNER ADJUSTMENT TABLE (**ECO5** FM/MW- and FM/MW/LW - versions with AM-frame aerial)

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter	
VARICAP ALIGNMENT							
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)			108MHz	5130	1	8V ±0.2V	
			87.5MHz (65.81MHz)	check		4.3V ±0.5V (1.2V ±0.5V)	
MW FM/AM-version, 10kHz grid 530 - 1700kHz			1700kHz	5123		8V ±0.2V	
			530kHz	check		1.1V ±0.4V	
FM/MW-version, 9kHz grid 531 - 1602kHz			1602kHz	5123		6.9V ±0.2V	
			531kHz	check		1.1V ±0.4V	
LW 153 - 279kHz			279kHz	5122		8V ±0.2V	
			153kHz	check		1.1V ±0.4V	
MW FM/MW/LW- version, 9kHz grid 531 - 1602kHz			1602kHz	5123		8V ±0.2V	
			531kHz	check		1.1V ±0.4V	
FM RF							
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)	108MHz	A	108MHz	2155	4	MAX	↕
	87.5MHz (65.81MHz)	mod=1kHz Δf=±22.5kHz	87.5MHz (65.81MHz)	5131			
VCO							
FM	98MHz, 1mV continuous wave	A	98MHz	3142	3	152kHz ±1kHz 1)	
AM IF							
MW	450kHz connect pin 26 of IC 7101 (AM Osc.) with short wire to ground (pin 4)	C Δf=±15kHz V_{RF} = 3mV		5111	4		
			 see remark 2)	5112			
AM AFC **MW**		C continuous wave V_{RF} = 10mV		5114	2	0 ± 2 mV DC	
AM RF 3)							
MW 4) FM/MW/LW- and FM/MW-version (9kHz grid) 531 - 1602kHz	1494kHz		1494kHz	2106	4		↕
	558kHz		558kHz	5102			
LW	198kHz		198kHz	5103			
MW FM/AM-version, 10kHz grid 530 - 1700kHz	1500kHz	Δf = ±30kHz V_{RF} as low as possible	1500kHz	2106			↕
	560kHz		560kHz	5102			

ECO5. 170996

Use service test program. By selecting the TUNER TEST test frequencies will be stored as preset frequencies automatically.

1) If sensitivity of frequency counter is too low adjust to max. channel separation
(input signal: stereo left 90% + 9%, adjust output on right channel to minimum)

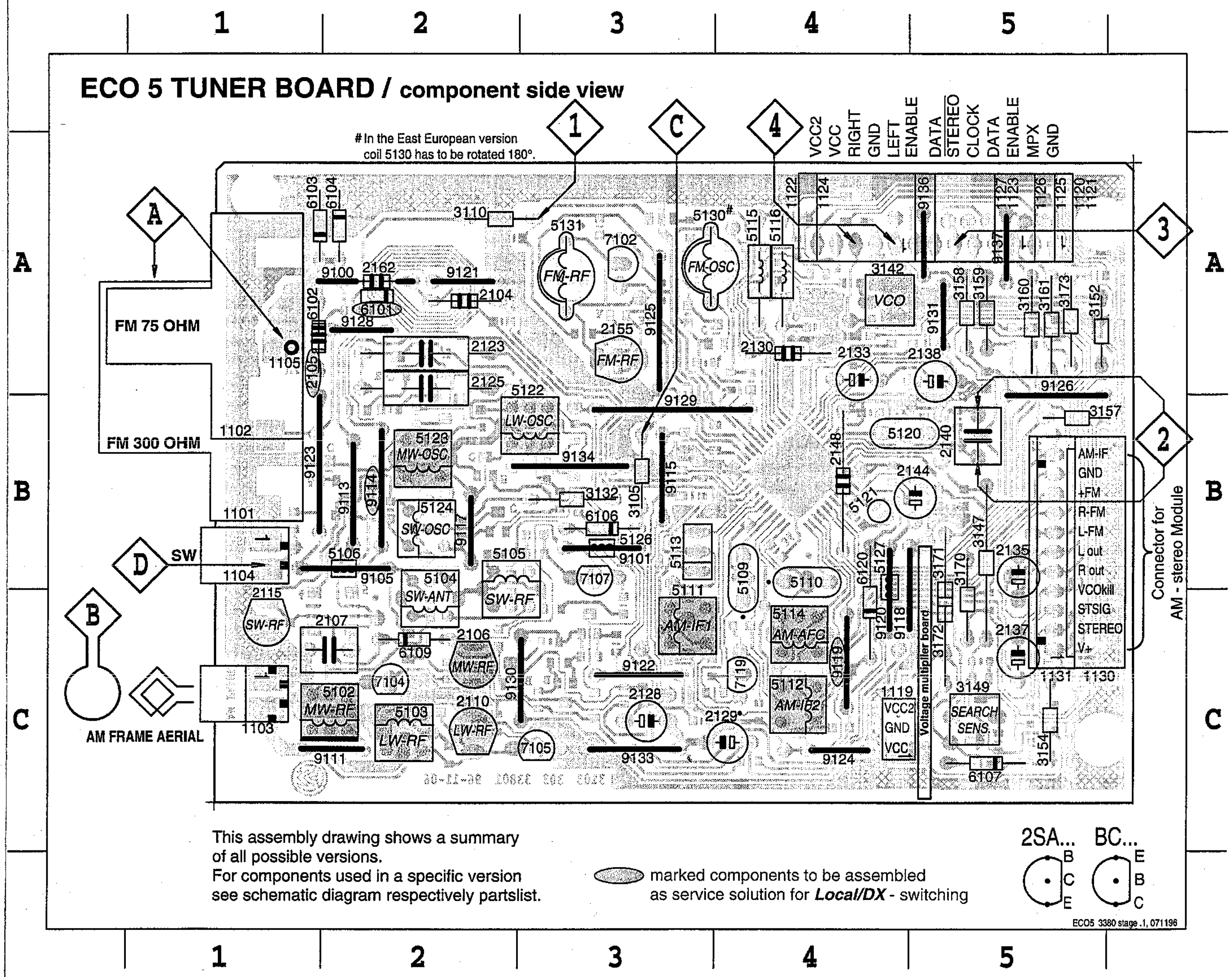
2) RC network serves for damping the IF-filter while adjusting the other one.

3) *For AM RF adjustments the original frame antenna has to be used !*

4) MW has to be aligned before LW.

↕ Repeat

1101	A1	2106	C2	2137	C5	3147	B5	3172	C5	5112	C4	5130	A3	7104	C2	9118	B4	9130	C3
1102	A1	2107	C2	2138	A5	3149	C5	3173	A5	5113	B3	5131	A3	7105	C3	9119	C4	9131	A5
1103	C1	2110	C2	2140	B5	3152	A5	5102	C2	5114	C4	6101	A2	7107	B3	9120	B4	9133	C3
1104	B1	2115	C1	2144	B5	3154	C5	5103	C2	5115	A4	6102	A1	9100	A2	9121	A2	9134	B3
1105	A1	2123	A2	2148	B4	3157	B5	5104	C2	5116	A4	6103	A1	9101	B3	9122	C3	9136	A5
1119	C5	2125	A2	2155	A3	3158	A5	5105	B2	5120	B4	6104	A2	9105	B2	9123	B1	9137	A5
1120	A5	2128	C3	2162	A2	3159	A5	5106	B2	5121	B4	6106	B3	9111	C2	9124	C4		
1130	B5	2129	C4	3105	B3	3160	A5	5108	C4	5122	B3	6107	C5	9113	B2	9125	A3		
1131	B5	2130	A4	3110	A2	3161	A5	5109	B4	5123	B2	6109	C2	9114	B2	9126	B5		
2104	A2	2133	A4	3132	B3	3170	C5	5110	B4	5124	B2	6120	C4	9115	B3	9128	A2		
2105	A1	2135	B5	3142	A4	3171	C5	5111	C3	5126	B3	7102	A3	9117	B2	9129	B3		



ECO 5 TUNER BOARD / component side view

In the East European version coil 5130 has to be rotated 180°.

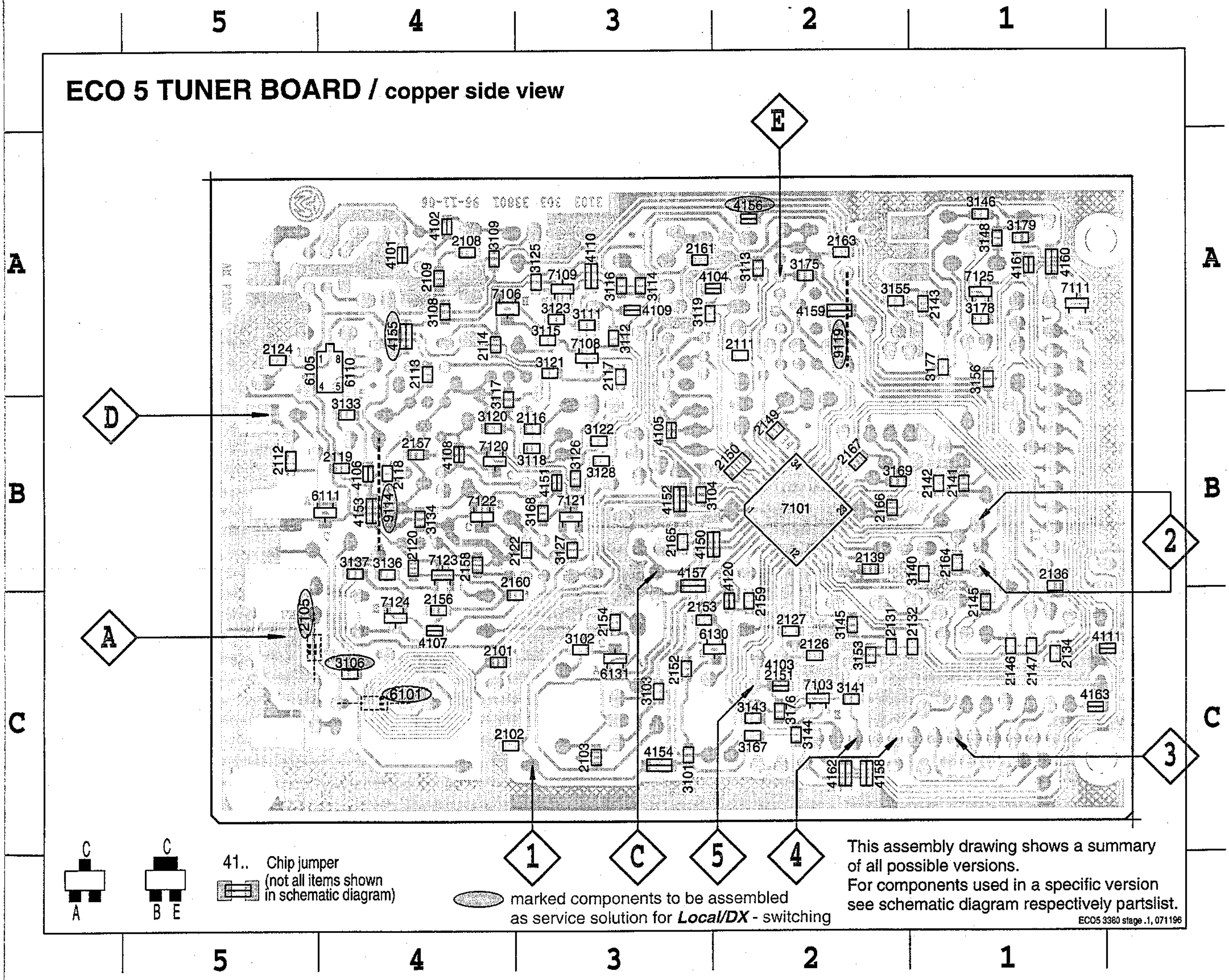
1
2
3
4
5
A
B
C
VCC2
VCC
RIGHT
GND
LEFT
ENABLE
DATA
STEREO
CLOCK
DATA
ENABLE
MPX
GND
FM 75 OHM
FM 300 OHM
SW
AM FRAME AERIAL
FM-RF
FM-OSC
VCO
LW-OSC
MW-OSC
SW-OSC
SW-ANT
SW-RF
SW-RF
MW-RF
MW-RF
LW-RF
LW-RF
AM-IF1
AM-AFC
AM-IF2
SEARCH SENS.
Voltage multiplier board
VCC2
GND
VCC
AM-IF
GND
+FM
R-FM
L-FM
L out
R out
VCOkill
STSIG
STEREO
V+
Connector for AM - stereo Module
2SA...
BC...
B
C
E
E
B
C
ECO5 3380 stage .1, 071196

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

marked components to be assembled as service solution for ***Local/DX*** - switching

2101	C4	2119	B4	2141	B1	2154	C3	3101	C3	3116	A3	3133	B4	3153	C2	4103	C2	4151	B3	6110	A4	7121	B3
2102	C4	2120	B4	2142	B1	2156	C4	3102	C3	3117	B4	3134	B4	3155	A2	4104	A2	4152	B3	6111	B4	7122	B4
2103	C3	2122	B3	2143	A1	2157	B4	3103	C3	3118	B3	3136	B4	3156	A1	4105	B3	4153	B4	6130	C2	7123	B4
2108	A4	2124	A5	2145	C1	2158	B4	3104	B3	3120	B4	3137	B4	3167	C2	4106	B4	4154	C3	6131	C3	7124	C4
2109	A4	2126	C2	2146	C1	2159	C2	3106	C4	3121	A3	3140	B1	3168	B3	4107	C4	4155	A4	7101	B2		
2112	B5	2127	C2	2147	C1	2160	C4	3108	A4	3122	B3	3141	C2	3169	B2	4108	B4	4156	A2	7103	C2		
2113	A4	2131	C2	2149	B2	2161	A3	3109	A4	3123	A3	3143	C2	3175	A2	4109	A3	4157	B3	7106	A4		
2114	A4	2132	C1	2150	B2	2163	A2	3111	A3	3125	A3	3144	C2	3176	C2	4110	A3	4158	C2	7108	A3		
2116	B3	2134	C1	2151	C2	2165	B3	3112	A3	3126	B3	3145	C2	3177	A1	4111	C1	4159	A2	7109	A3		
2117	A3	2136	B1	2152	C3	2166	B2	3114	A3	3127	B3	3146	A1	4101	A4	4120	C2	4160	A1	7111	A1		
2118	B4	2139	B2	2153	C3	2167	B2	3115	A3	3128	B3	3148	A1	4102	A4	4150	B2	6105	A4	7120	B4		

ECO 5 TUNER BOARD / copper side view



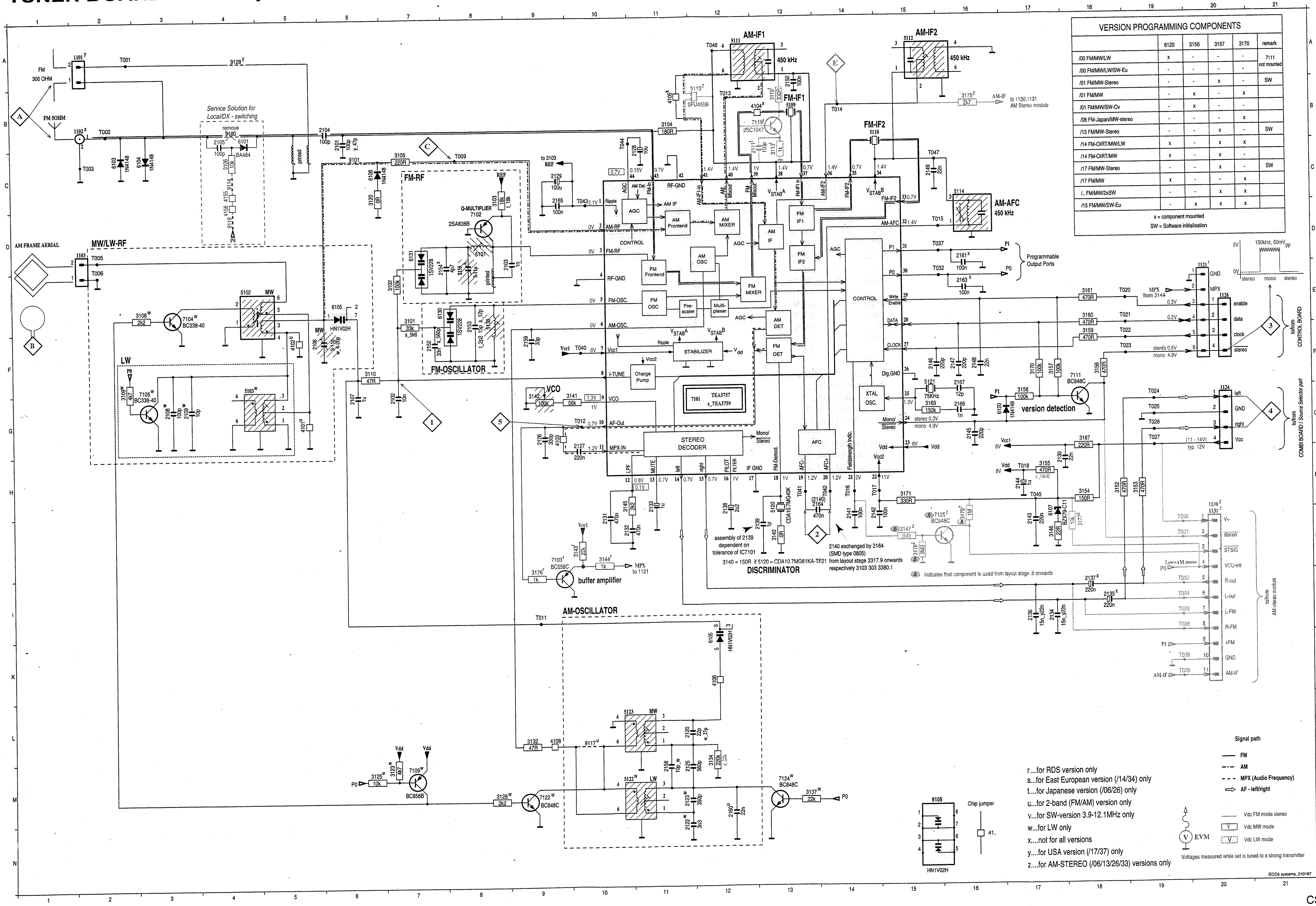
41.. Chip jumper (not all items shown in schematic diagram)

marked components to be assembled as service solution for *Local/DX* - switching

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

ECO5 3360 stage .1, 071196

TUNER BOARD ECO5 / Systems


AM-IF1
AM-IF2
FM-IF1
FM-IF2
AM-AFC
450 kHz
FM-RF
MW/LW-RF
LW
MW
FM-OSCILLATOR
AM-OSCILLATOR
VCO
AM FRAME AERIAL
FM 300 OHM
FM 50OHM
Service Solution for Local/DX - switching
Q-MULTIPLIER 7102
AGC
CONTROL
AM Frontend
AM MIXER
AM IF
AM OSC
FM Frontend
FM MIXER
FM OSC
Pre-scaler
Multi-plexer
FM IF1
FM IF2
AM DET
FM DET
STABILIZER
Charge Pump
STEREO DECODER
AFC
XTAL OSC.
7101 TEA5757 z_TEA5759
DISCRIMINATOR
buffer amplifier
version detection
Programmable Output Ports
to/from CONTROL BOARD
to/from COMBI BOARD / Source Selector part
to/from AM-stereo module
150kHz, 50mVpp
5V
0V
stereo
mono
stereo
GND
MPX
enable
data
clock
stereo
left
right
Vcc
assembly of 2139 dependent on tolerance of IC7101
3140 = 150R if 5120 = CDA10.7MG61KA-TF21
2140 exchanged by 2164 (SMD type 0805) from layout stage 3317.9 onwards respectively 3103 303 3380.1
.6 indicates that component is used from layout stage .6 onwards
6105
HN1V02H
Chip jumper
41..

VERSION PROGRAMMING COMPONENTS

	6120	3156	3157	3170	remark
/00 FM/MW/LW	x	-	-	-	7111 not mounted
/00 FM/MW/LW/SW-Eu	-	-	-	-	
/01 FM/MW-Stereo	-	-	x	-	SW
/01 FM/MW	-	x	-	x	
/01 FM/MW/SW-Ov	-	x	-	-	
/06 FM-Japan/MW-stereo	-	-	-	x	
/13 FM/MW-Stereo	-	-	x	-	SW
/14 FM-OIRT/MW/LW	x	-	x	x	
/14 FM-OIRT/MW	x	-	x	-	
/17 FM/MW-Stereo	-	-	x	-	SW
/17 FM/MW	x	-	-	x	
/.. FM/MW/2xSW	-	-	x	x	
/15 FM/MW/SW-Eu	-	x	x	x	

x = component mounted
SW = Software initialisation

r....for RDS version only
s...for East European version (/14/34) only
t....for Japanese version (/06/26) only
u...for 2-band (FM/AM) version only
v...for SW-version 3.9-12.1MHz only
w...for LW only
x....not for all versions
y....for USA version (/17/37) only
z....for AM-STEREO (/06/13/26/33) versions only

Signal path

──	**FM**
─·─	**AM**
- - -	**MPX (Audio Frequency)**
⇨	**AF - left/right**

………	Vdc FM mode stereo
V	Vdc MW mode
V	Vdc LW mode

EVM

Voltages measured while set is tuned to a strong transmitter

1101	A 1
1102	B 2
1103	D 2
1121	E20
1124	G20
1126	E20
1130	I20
1131	I20
2101	C 6
2102	G 7
2103	D 9
2104	B 6
2106	F 5
2107	G 6
2108	G 3
2109	G 3
2111	C13
2120	L11
2122	N11
2123	M11
2125	M11
2126	G 9
2127	G10
2128	C11
2129	C 9
2130	H17
2131	I10
2132	I10
2133	H11
2134	J17
2135	J18
2136	J17
2137	J18
2138	H12
2139	I13
2140	H14
2141	H14
2142	H14
2143	I17
2144	H17
2145	G16
2146	F15
2147	F16
2148	F16
2149	C15
2150	B13
2152	F 7
2153	E 8
2154	E 7
2155	D 8
2158	M11
2159	F 9
2160	M12
2161	D16
2163	E16
2164	H14
2165	C 9
2166	G16
2167	F16
3101	E 7
3102	E 7
3103	C 8
3104	B11
3105	C 7
3108	E 3
3109	F 2
3110	F 6
3113	C13
3119	B13
3120	C 6
3123	M 7
3125	M 6
3128	M 8
3132	L 9
3134	M12
3137	M13
3140	I13
3141	G10
3142	G 9
3143	I10
3144	I10
3145	H10
3146	I17
3147	I15
3152	H18
3153	H19
3154	H18
3155	H17
3156	G17
3157	F17
3158	F18
3159	F18
3160	E18
3161	E18
3167	G18
3169	G15
3170	F17
3171	H15
3175	B16
3176	J 9
3177	I18
3178	I15
3179	I16
4101	G 5
4102	F 5
4103	G 9
4104	B13
4105	B11
4106	K12
4108	L 9
5102	E 4
5103	F 4
5109	B13
5110	B14
5111	A13
5112	A15
5113	B12
5114	C16
5120	H13
5121	F15
5122	M11
5123	L11
5130	E 8
5131	D 8
6103	C 2
6104	C 3
6105	K12
6105	E 6
6106	C 6
6107	H17
6120	G16
6130	E 7
6131	D 7
7101	G11
7102	D 8
7103	I 9
7104	E 3
7105	F 2
7109	M 7
7111	F18
7119	B13
7122	M 9
7124	M13
7125	I16
9100	B 4
9101	C 6
9117	L10
9128	A 4

ELECTRICAL PARTSLIST ECO5 TUNER BOARD

MISCELLANEOUS

1101	4822 267 31505	ANTENNA SOCKET, 300Ω
1102	4822 267 10283	ANTENNA SOCKET, COAX IEC 75Ω

CAPACITORS

2101©	5322 122 32531	100pF	5%	50V	
2102©	4822 122 33177	10nF	20%	50V	
2103©	5322 122 34123	1nF	10%	50V	
2104	4822 122 33195	100pF	10%	50V	
2106	4822 125 60101	3-11pF TRIMCAP.			
2107	4822 121 51319	1μF	20%	50V	
2120©	5322 122 32658	22pF	5%	50V	
2125	4822 121 51381	560pF	1%	400V	
2126©	5322 122 31863	330pF	5%	50V	
2127©	4822 122 32927	220nF	10%	63V	
2127©	4822 126 13473	220nF	20%	50V	
2128	4822 124 41579	10μF	20%	50V	
2129	4822 124 41584	100μF	20%	10V	
2130	4822 126 11585	22nF	20%	50V	
2131©	4822 122 33325	470nF	20%	50V	
2131©	4822 126 13482	470nF	20%	16V	
2132©	4822 122 33325	470nF	20%	50V	
2132©	4822 126 13482	470nF	20%	16V	
2133	4822 124 40242	1μF	20%	63V	
2134©	4822 122 33128	15nF	10%	63V	not for USA
2134©	5322 122 32654	22nF	10%	63V	for USA only
2135	4822 124 40746	0,22μF	20%	63V	
2136©	4822 122 33128	15nF	10%	63V	not for USA
2136©	5322 122 32654	22nF	10%	63V	for USA only
2137	4822 124 40746	0,22μF	20%	63V	
2138	4822 124 41576	2,2μF	20%	50V	
2139©	5322 122 32447	1pF	5%	50V	
2141©	4822 126 10002	100nF	20%	50V	
2142©	4822 126 10002	100nF	20%	50V	
2143©	4822 126 13473	220nF	20%	50V	
2144	4822 124 40242	1μF	20%	63V	
2145©	4822 122 33575	220pF	5%	50V	
2146©	4822 122 33575	220pF	5%	50V	
2147©	4822 122 33575	220pF	5%	50V	
2148	4822 126 11585	22nF	20%	50V	
2149©	5322 122 32654	22nF	10%	63V	
2150©	4822 122 31947	100nF	20%	50V	
2152©	4822 122 33342	33nF	10%	63V	not for East Europe
2152©	5322 116 80853	560pF	5%	63V	for East Europe only
2153©	4822 122 32139	12pF	5%	63V	for East Europe only
2153©	5322 122 32481	15pF	5%	50V	not for East Europe
2155	4822 125 60101	3-11pF TRIMCAP.			
2159©	5322 122 32659	33pF	5%	50V	
2160©	5322 122 32654	22nF	10%	63V	
2164©	4822 126 13482	470nF	20%	16V	
2165©	4822 126 10002	100nF	20%	50V	
2166©	5322 122 34123	1nF	10%	50V	
2167©	4822 122 32139	12pF	5%	63V	

RESISTORS

3101©	4822 051 20333	33kΩ	5%	0,1W	not for East Europe
3101©	4822 051 20562	5,6kΩ	5%	0,1W	for East Europe only
3102©	4822 051 20104	100kΩ	5%	0,1W	
3103©	4822 051 20183	18kΩ	5%	0,1W	
3104©	4822 117 11448	180Ω	10%	0,1W	
3105	4822 116 83872	220Ω	5%	0,5W	
3110	4822 116 52195	47Ω	5%	0,5W	
3120©	4822 051 20008	CHIP JUMPER 0805			

RESISTORS

3132	4822 116 52195	47Ω	5%	0,5W	
3134©	4822 051 20224	220kΩ	5%	0,1W	
3140©	4822 051 20008	CHIP JUMPER 0805			5120=CDA10.7MG40K
3140©	4822 117 10353	150Ω	5%	0,1W	5120=CDA10.7MG61KA
3141©	4822 051 20563	56kΩ	5%	0,1W	
3142	4822 100 11163	100kΩ TRIMPOT. LIN.			
3143©	4822 051 20223	22kΩ	5%	0,1W	for RDS version only
3144©	4822 051 10102	1kΩ	5%	0,1W	for RDS version only
3145©	4822 117 11449	2,2kΩ	1%	0,1W	
3146©	4822 051 20229	22Ω	5%	0,1W	
3152	4822 116 83883	470Ω	5%	0,16W	
3153©	4822 051 20471	470Ω	5%	0,1W	
3154	4822 116 83868	150Ω	5%	0,5W	
3155©	4822 051 20471	470Ω	5%	0,1W	
3156©	4822 051 20104	100kΩ	5%	0,1W	for /21/30/33 only
3157	4822 116 52234	100kΩ	5%	0,5W	for East Europe only
3158	4822 116 83883	470Ω	5%	0,16W	
3159	4822 116 83883	470Ω	5%	0,16W	
3160	4822 116 83883	470Ω	5%	0,16W	
3161	4822 116 83883	470Ω	5%	0,16W	
3167©	4822 117 11503	220Ω	5%	0,1W	
3169©	4822 051 20154	150kΩ	5%	0,1W	
3170	4822 116 52234	100kΩ	5%	0,5W	
3171	4822 116 52219	330Ω	5%	0,5W	
3176©	4822 051 10102	1kΩ	5%	0,1W	for RDS version only
4101©	4822 051 20008	CHIP JUMPER 0805			
4102©	4822 051 20008	CHIP JUMPER 0805			
4103©	4822 051 20008	CHIP JUMPER 0805			
4104©	4822 051 20008	CHIP JUMPER 0805			
4105©	4822 051 20008	CHIP JUMPER 0805			
4106©	4822 051 20008	CHIP JUMPER 0805			
4108©	4822 051 20008	CHIP JUMPER 0805			
4111©	4822 051 20008	CHIP JUMPER 0805			
4120©	4822 051 20008	CHIP JUMPER 0805			
4150©	4822 051 10008	CHIP JUMPER 1206			
4152©	4822 051 10008	CHIP JUMPER 1206			
4153©	4822 051 10008	CHIP JUMPER 1206			
4154©	4822 051 10008	CHIP JUMPER 1206			
4157©	4822 051 10008	CHIP JUMPER 1206			
4158©	4822 051 10008	CHIP JUMPER 1206			
4159©	4822 051 10008	CHIP JUMPER 1206			
4162©	4822 051 10008	CHIP JUMPER 1206			for RDS version only

COILS

5102	4822 157 71634	RF-COIL MW
5109	4822 242 70665	CER. FILTER 10,7MHZ
5110	4822 242 70665	CER. FILTER 10,7MHZ
5111	4822 158 60511	AM-IF FILTER 450kHz
5112	4822 157 70302	AM-IF FILTER 450kHz
5114	4822 157 70302	AM-IF FILTER 450kHz (AM AFC)
5120	4822 242 10251	CER. DISCRIMINATOR 10.7MG61KA-TF21
5120	4822 242 82065	CER. DISCRIMINATOR 10.7MG40K
5121	4822 242 10261	QUARTZ 75kHz
5123	4822 157 60517	OSC. COIL MW
5130	4822 156 30947	RF COIL 1,5 TURNS
5131	4822 156 30947	RF COIL 1,5 TURNS

ELECTRICAL PARTSLIST ECO5 TUNER BOARD

DIODES

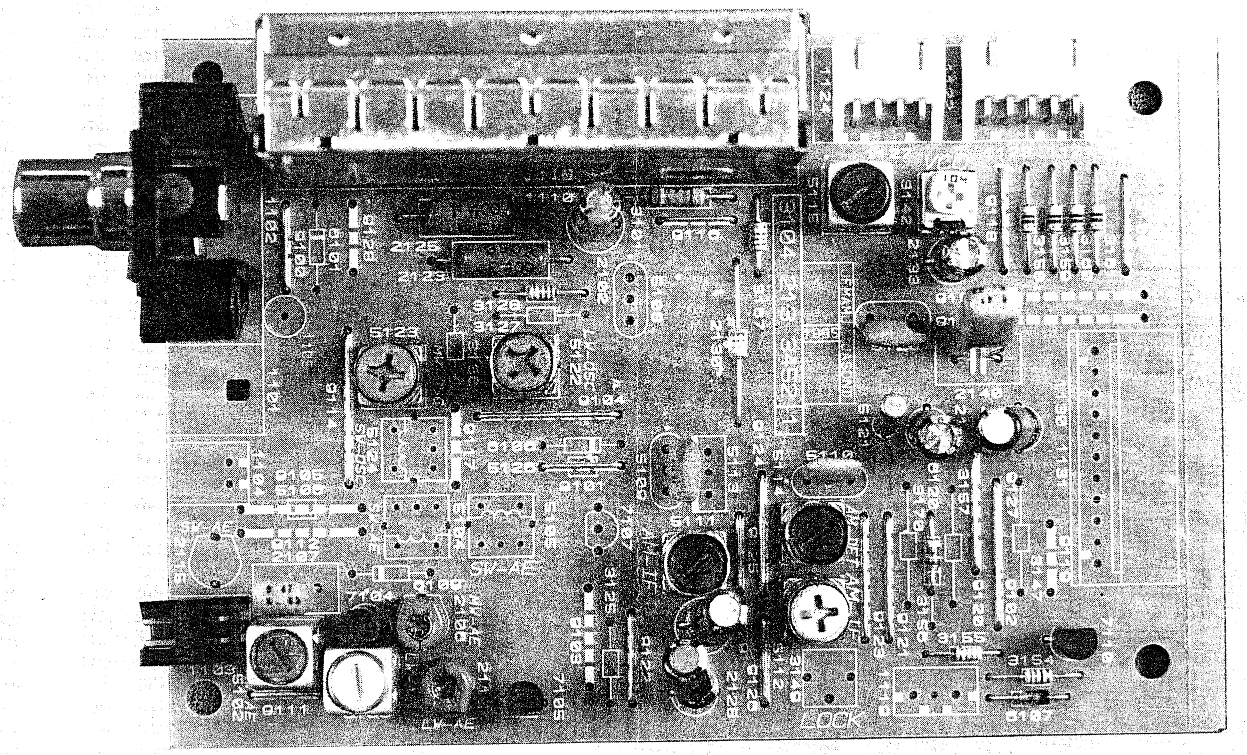
6103	4822 130 30621	1N4148	
6104	4822 130 30621	1N4148	
6105©	4822 130 83075	HN1V02H	
6106	4822 130 30621	1N4148	
6107	4822 130 34488	BZX79-C11	
6120	4822 130 30621	1N4148	not for /21/30/33
6130©	4822 130 82833	1SV228	
6131©	4822 130 82833	1SV228	

TRANSISTORS

7102	4822 130 60093	2SA838B	
7103©	4822 130 42513	BC558C	for RDS version only
7111©	5322 130 42136	BC848C	

INTEGRATED CIRCUITS

7101©	4822 209 90924	TEA5757H/V1, RADIO IC



TUNER 95 BOARD

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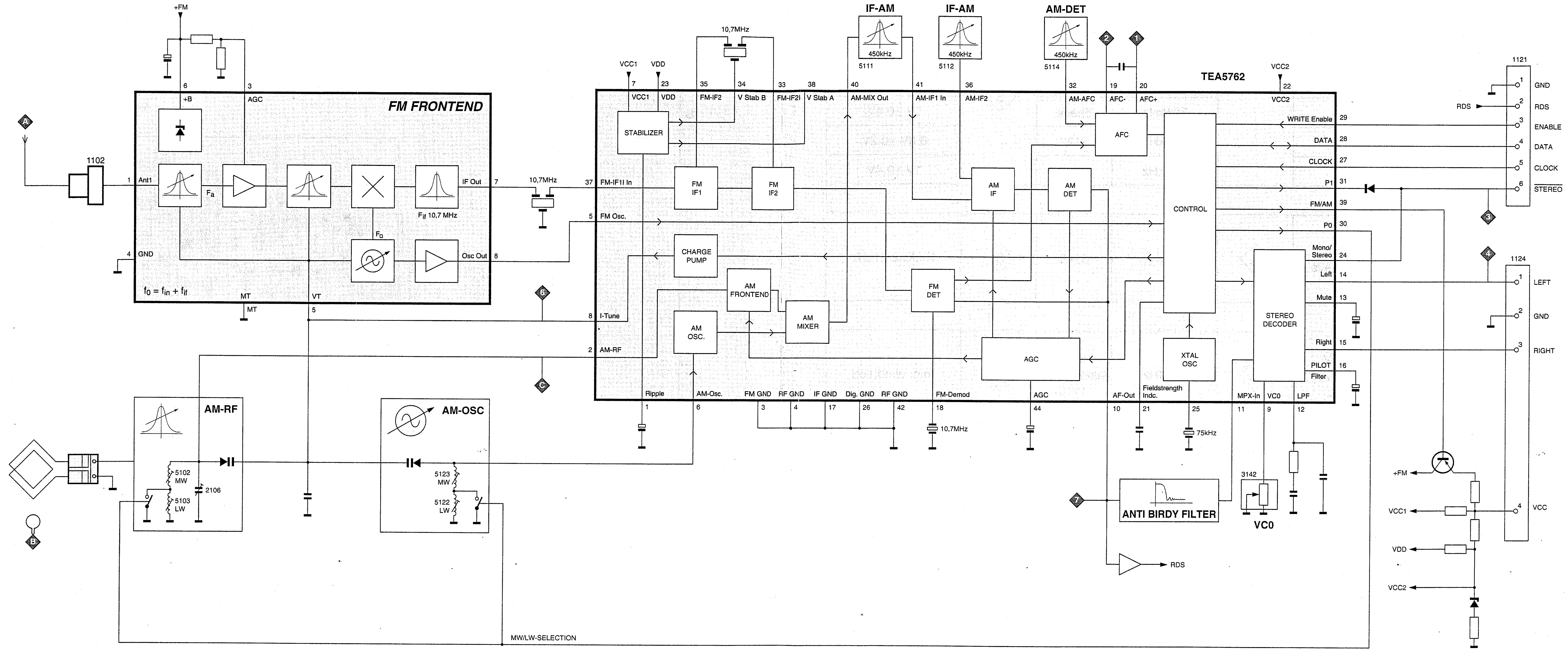
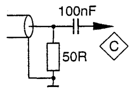
BLOCKDIAGRAM


+FM
FM FRONTEND
+B
AGC
Ant1
1102
GND
Fa
Fo
Fif 10,7 MHz
IF Out
Osc Out
f0 = fin + fif
MT
VT
10,7MHz
IF-AM
IF-AM
AM-DET
450kHz
5111
5112
5114
TEA5762
VCC1
VDD
VCC2
FM-IF2
V Stab B
FM-IF2I
V Stab A
AM-MIX Out
AM-IF1 In
AM-IF2
AM-AFC
AFC-
AFC+
FM-IF1I In
FM Osc.
I-Tune
AM-RF
STABILIZER
FM IF1
FM IF2
AM IF
AM DET
AFC
CONTROL
CHARGE PUMP
AM FRONTEND
AM MIXER
AM OSC.
FM DET
AGC
XTAL OSC
STEREO DECODER
WRITE Enable
DATA
CLOCK
P1
FM/AM
P0
Mono/ Stereo
Left
Mute
Right
PILOT Filter
Ripple
AM-Osc.
FM GND
RF GND
IF GND
Dig. GND
RF GND
FM-Demod
AGC
AF-Out
Fieldstrength Indc.
MPX-In
VCO
LPF
75kHz
1121
GND
RDS
ENABLE
DATA
CLOCK
STEREO
1124
LEFT
GND
RIGHT
VCC
AM-RF
AM-OSC
5102 MW
5103 LW
2106
5123 MW
5122 LW
3142
ANTI BIRDY FILTER
VC0
RDS
+FM
VCC1
VDD
VCC2
MW/LW-SELECTION

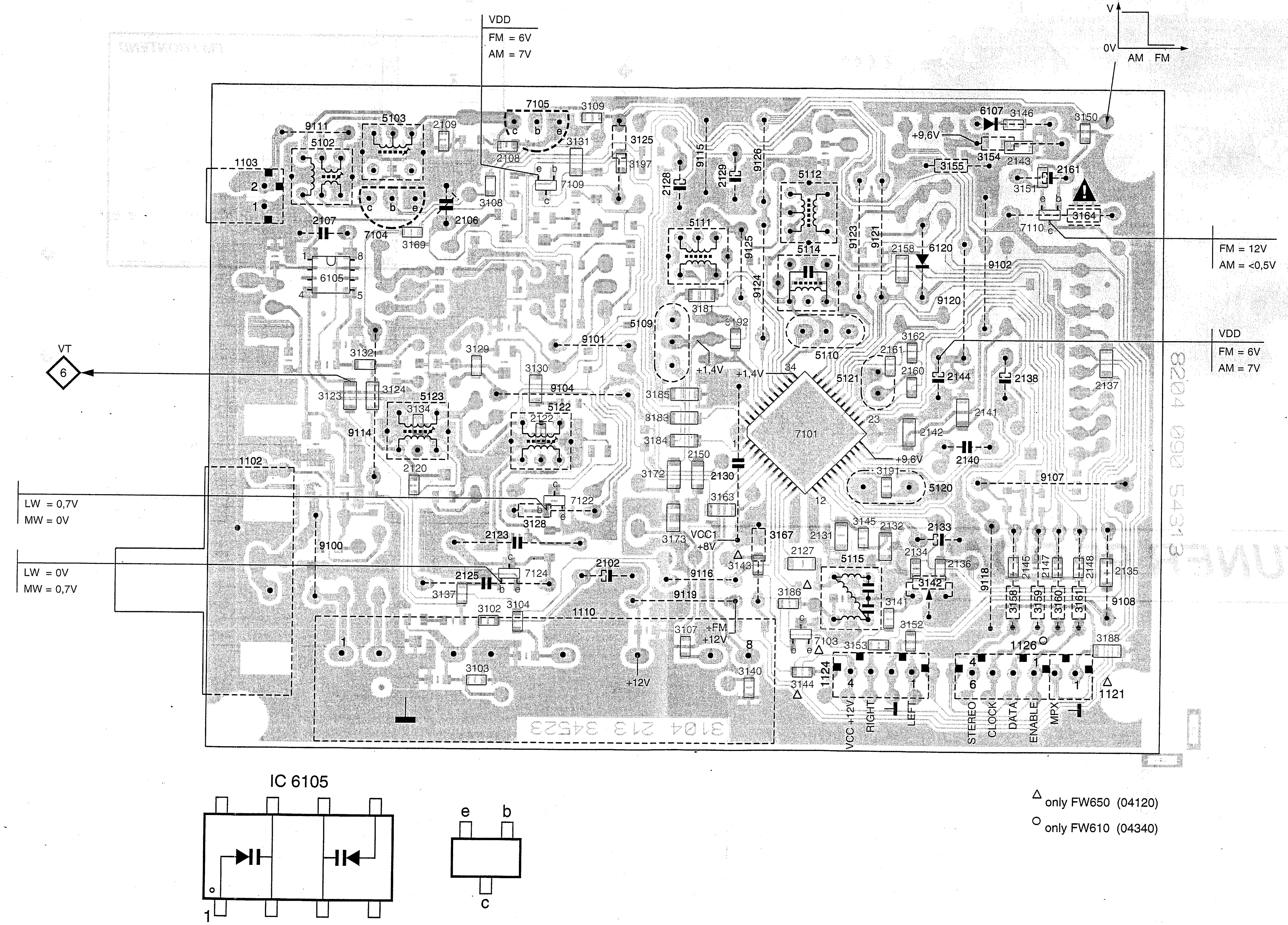
ADJUSTMENT TABLE

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (50kHz grid)			108MHz	check	6	7...9V
			87.5MHz	check		1.3...2V
MW 531 - 1602kHz (9kHz grid)			1602kHz	5123		8.3V ±0.2V
			531kHz	check		1V ±0.4V
LW 153 - 279kHz (3kHz grid)			279kHz	5122		8.3V ±0.2V
			153kHz	check		1V ±0.4V
FM - VCO						
FM	98MHz 1mV continuous wave	A	98MHz	3142	3	152kHz ±1kHz
DISTORTION						
FM	98MHz 1mV 90% L, 9% pilot mod=1kHz	A	98MHz	mixcoil inside tuner 1110	4	min. distortion
AM IF						
MW	450kHz Δf=10kHz as low as possible			5111	7	symmetrical and max. height ↕
				5112		
	450.0kHz continuous wave	C		5114	1 2	0mV ±2mV
AM RF						
MW	588kHz mod=1kHz, 30% AM 1494kHz	B*	558kHz	5102	7	MAX ↕
			1494kHz	2106		
LW	198kHz mod=1kHz, 30% AM		198kHz	5103		MAX

* Signal supplied via frame antenna

↕ Repeat

TUNER 95 – Copperside view


VDD
FM = 6V
AM = 7V
V
0V
AM
FM
FM = 12V
AM = <0,5V
VDD
FM = 6V
AM = 7V
VT
6
LW = 0,7V
MW = 0V
LW = 0V
MW = 0,7V
1103
1102
9100
1110
6105
7101
7105
7104
7109
7110
7122
7124
7103
5102
5103
5109
5110
5111
5112
5114
5115
5120
5121
5122
5123
6107
6120
+9,6V
+1,4V
+8V
VCC1
+FM
+12V
+12V
1124
1126
1121
VCC +12V
RIGHT
LEFT
STEREO
CLOCK
DATA
ENABLE
MPX
3104 213 34523
8204 090 54313
IC 6105
1
e
b
c

△ only FW650 (04120)

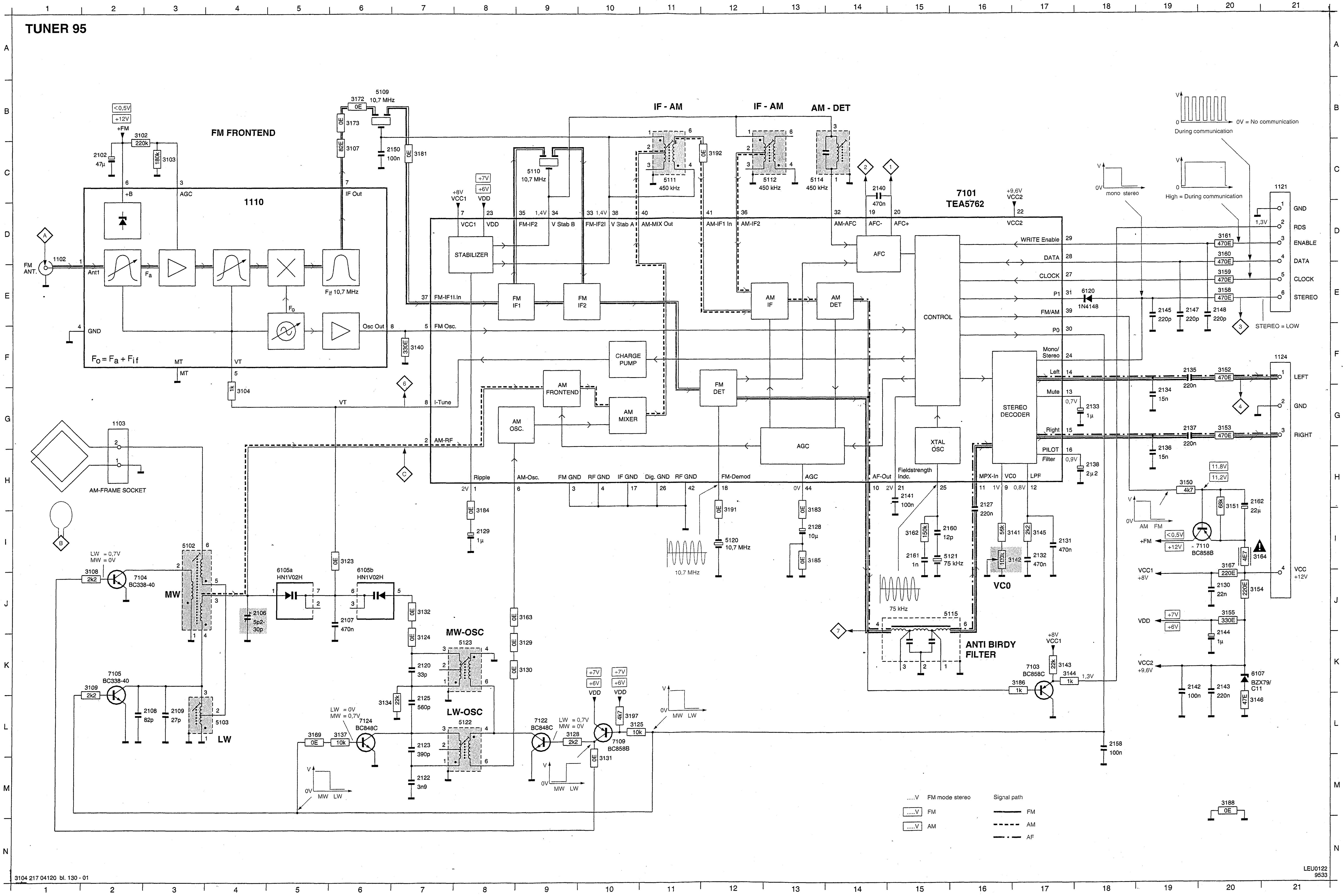
○ only FW610 (04340)

1102	F4	3181	D8
1103	C3	3183	E7
1110	G7	3184	E7
1121	H11	3185	E7
1124	H9	3186	G8
1126	G10	3188	G11
2102	G7	3191	F9
2106	C5	3192	D8
2107	D4	3197	C7
2108	C6	5102	C4
2109	C5	5103	C5
2120	F5	5109	D7
2122	E6	5110	E9
2123	F6	5111	C8
2125	G5	5112	C9
2127	F8	5114	D9
2128	C7	5115	G9
2129	C8	5120	F10
2130	F8	5121	E9
2131	F9	5122	E6
2132	F9	5123	E5
2133	F10	6105	D4
2134	F9	6107	B10
2135	G11	6120	D10
2136	G10	7101	E9
2137	E11	7103	G9
2138	E10	7104	D5
2140	F10	7105	B6
2141	E10	7109	C6
2142	E10	7110	D11
2143	C10	7122	F7
2144	E10	7124	G6
2145	G11	9100	F4
2147	G11	9101	E7
2148	G11	9102	D10
2150	F8	9104	E6
2158	D9	9107	F11
2160	E9	9108	G11
2161	E9	9111	C4
2161	C11	9114	E5
3102	G6	9115	C8
3103	H6	9116	G8
3104	G6	9118	G10
3107	G7	9119	G7
3108	C6	9120	D10
3109	B7	9121	D9
3123	E4	9123	D9
3124	E5	9124	D8
3125	C7	9125	D8
3128	F6	9126	C8
3129	E6		
3130	E6		
3131	C6		
3132	E5		
3134	E5		
3137	G5		
3140	H8		
3141	G9		
3142	G10		
3143	G8		
3144	H8		
3145	F9		
3146	B10		
3150	C11		
3151	C10		
3152	G9		
3153	G9		
3154	C10		
3155	C10		
3158	G10		
3159	G11		
3160	G11		
3161	G11		
3162	E9		
3163	F8		
3164	C11		
3167	F8		
3169	D5		
3172	F7		
3173	F7		

1102	D1	1124	F21	2108	L3	2123	L7	2129	I8	2133	G18	2137	G19	2142	K19	2147	E19	2160	I15	3103	C3	3109	K2	3128	L9	3132	J7
1103	G2	2102	C2	2109	L3	2125	L7	2130	J20	2134	G19	2138	H18	2143	K20	2148	E20	2161	I15	3104	G4	3123	I6	3129	K9	3134	L6
1110	D4	2106	J4	2120	K7	2127	H16	2131	I17	2135	F19	2140	C14	2144	K20	2150	C6	2162	H20	3107	C6	3124	K7	3130	K9	3137	L6
1121	C21	2107	J6	2122	M7	2128	I13	2132	I17	2136	H19	2141	H15	2145	E19	2158	L18	3102	B2	3108	J2	3125	L10	3131	M10	3140	F7

3141	I16	3145	I17	3152	F20	3158	E20	3162	I15	3169	L5	3183	I13	3188	M20	5102	I3	5111	C11	5120	I12	6105a	I5	7101	C16	7109	L10
3142	I16	3146	L20	3153	G20	3159	E20	3163	J9	3172	B6	3184	I8	3191	I12	5103	L4	5112	C12	5121	I15	6105b	I6	7103	K17	7110	I19
3143	K17	3150	H19	3154	J20	3160	D20	3164	I20	3173	B6	3185	I13	3192	C12	5109	B6	5114	C13	5122	L8	6107	K20	7104	J2	7122	L9
3144	K17	3151	I20	3155	J20	3161	D20	3167	I20	3181	C7	3186	K16	3197	L10	5110	C9	5115	J15	5123	K8	6120	E18	7105	K2	7124	L6

TUNER 95


FM FRONTEND
1110
IF - AM
IF - AM
AM - DET
7101
TEA5762
FM ANT.
Ant1
GND
IF Out
Osc Out
Fo = Fa + Fif
Fif 10,7 MHz
MT
VT
AGC
+B
+FM
<0,5V
+12V
3102 220k
3103 180k
2102 47µ
5109 10,7 MHz
3172 0E
3173 0E
3107 82E
2150 100n
3181 0E
5110 10,7 MHz
5111 450 kHz
5112 450 kHz
5114 450 kHz
3192 0E
2140 470n
STABILIZER
FM IF1
FM IF2
AM IF
AM DET
AFC
CONTROL
CHARGE PUMP
AM FRONTEND
AM MIXER
AM OSC.
FM DET
AGC
XTAL OSC
STEREO DECODER
VCC1
VDD
FM-IF2
V Stab B
FM-IF2I
V Stab A
AM-MIX Out
AM-IF1 In
AM-IF2
AM-AFC
AFC-
AFC+
VCC2
FM-IF1I.In
FM Osc.
I-Tune
AM-RF
Ripple
AM-Osc.
FM GND
RF GND
IF GND
Dig. GND
RF GND
FM-Demod
AGC
AF-Out
Fieldstrength Indc.
MPX-In
VCO
LPF
WRITE Enable
DATA
CLOCK
P1
FM/AM
P0
Mono/ Stereo
Left
Mute
Right
PILOT Filter
6120 1N4148
3161 470E
3160 470E
3159 470E
3158 470E
2145 220p
2147 220p
2148 220p
1121
GND
RDS
ENABLE
DATA
CLOCK
STEREO
STEREO = LOW
0V = No communication
During communication
mono stereo
High = During communication
1124
LEFT
GND
RIGHT
2135 220n
3152 470E
2134 15n
2137 220n
3153 470E
2136 15n
2133 1µ
2138 2µ2
VCC +12V
3150 4k7
11,8V
11,2V
3151 68k
2162 22µ
7110 BC858B
3164 4E7
+FM
AM FM
VCC1 +8V
3167 220E
2130 22n
3154 220E
VDD
3155 330E
2144 1µ
+7V
+6V
VCC2 +9,6V
2142 100n
2143 220n
6107 BZX79/ C11
3146 47E
2158 100n
3188 0E
2141 100n
3162 150k
2160 12p
2161 1n
5121 75 kHz
3141 56k
3145 2k2
3142 100k
2131 470n
2132 470n
VCO
75 kHz
5115
ANTI BIRDY FILTER
7103 BC858C
3143 22k
3144 1k
3186 1k
+8V VCC1
3184 0E
2129 1µ
3191 0E
5120 10,7 MHz
10,7 MHz
3183 0E
2128 10µ
3185 0E
1103
AM-FRAME SOCKET
5102
MW
LW = 0,7V MW = 0V
3108 2k2
7104 BC338-40
7105 BC338-40
3109 2k2
2108 82p
2109 27p
5103
LW
2106 5p2- 30p
6105a HN1V02H
6105b HN1V02H
3123 0E
2107 470n
3132 0E
3124 0E
MW-OSC
5123
2120 33p
3134 22k
2125 560p
LW-OSC
5122
2123 390p
2122 3n9
3163 0E
3129 0E
3130 0E
LW = 0V MW = 0,7V
7124 BC848C
3169 0E
3137 10k
7122 BC848C
LW = 0,7V MW = 0V
3128 2k2
3131 0E
7109 BC858B
3197 4k7
3125 10k
MW LW
3140 330E
3104 1k
VT
....V FM mode stereo
.....V FM
.....V AM
Signal path
FM
AM
AF
3104 217 04120 bl. 130 - 01
LEU0122 9533

MISCELLANEOUS

1102	4822 267 10283	SOCKET COAX IEC 75R
1103	4822 265 31184	JST CONNECTOR 2 POLE
1110	4822 210 10492	FRONTEND ASSY /02/08

DIODES

6105	4822 130 83075	HN1V02H
6107	4822 130 34488	BZX79-C11
6120	4822 130 30621	1N4148

TRANSISTORS

7103	4822 130 42513	BC858C
7104	5322 130 44779	BC338-40
7105	5322 130 44779	BC338-40
7109	5322 130 41983	BC858B
7110	5322 130 41983	BC858B
7122	5322 130 42136	BC848C
7124	5322 130 42136	BC848C

INTEGRATED CIRCUITS

7101	4822 209 90315	TEA5762H/V1

COILS

5102	4822 157 71634	RF-COIL MW
5103	4822 157 71635	RF-COIL LW
5109	4822 157 71639	CER. FILTER 10,7MHz
5110	4822 242 70665	CER. FILTER 10,7MHZ
5111	4822 158 60511	AM-IF FILTER 450kHz
5112	4822 157 70302	AM-IF FILTER 450kHz
5114	4822 157 71637	AM-AFC FILTER 450KHZ
5115	4822 157 71636	ANTI-BIRDY FILTER
5120	4822 242 82065	CER. DISCRIMINATOR
5121	4822 242 81021	QUARTZ 75kHz
5122	4822 157 60517	RF-COIL AM
5123	4822 157 60517	RF-COIL AM

RESISTORS

3125	4822 116 83864	10k	5%	0,5W
3128	4822 116 52256	2k2	5%	0,16W
3142	4822 100 11163	TRIMPOT. 100K LIN.		
3154	4822 116 52215	220R	5%	0,16W
3155	4822 116 52219	330R	5%	0,5W
3158	4822 116 52224	470R	5%	0,5W
3159	4822 116 52224	470R	5%	0,5W
3160	4822 116 52224	470R	5%	0,5W
3161	4822 116 52224	470R	5%	0,5W
3164	4822 052 10478	4R7	5%	NFR
3167	4822 116 52215	220R	5%	0,16W

CHIP RESISTORS

3102	4822 051 20224	220k	5%	0,1W
3103	4822 051 20184	180k	5%	0,1W
3104	4822 051 10102	1k	2%	0,25W
3107	4822 051 20829	82R	5%	0,1W
3108	4822 051 20222	2k2	5%	0,1W
3109	4822 051 20222	2k2	5%	0,1W
3123	4822 051 10008	CHIP JUMPER 1206		
3124	4822 051 10008	CHIP JUMPER 1206		
3129	4822 051 20008	CHIP JUMPER 0805		
3130	4822 051 10008	CHIP JUMPER 1206		
3131	4822 051 10008	CHIP JUMPER 1206		
3132	4822 051 20008	CHIP JUMPER 0805		
3134	4822 051 20223	22k	5%	0,1W
3137	4822 051 20103	10k	5%	0,1W
3140	4822 051 20331	330R	5%	0,1W
3141	4822 051 20563	56k	5%	0,1W
3143	4822 051 20223	22k	5%	0,1W
3144	4822 051 10102	1k	2%	0,25W
3145	4822 051 20222	2k2	5%	0,1W
3146	4822 051 20479	47R	5%	0,1W
3150	4822 051 20472	4k7	5%	0,1W
3151	4822 051 20683	68k	5%	0,1W
3152	4822 051 20471	470R	5%	0,1W
3153	4822 051 20471	470R	5%	0,1W
3162	4822 051 20154	150k	5%	0,1W
3163	4822 051 10008	CHIP JUMPER 1206		
3169	4822 051 20008	CHIP JUMPER 0805		
3172	4822 051 10008	CHIP JUMPER 1206		
3173	4822 051 10008	CHIP JUMPER 1206		
3181	4822 051 10008	CHIP JUMPER 1206		
3183	4822 051 10008	CHIP JUMPER 1206		
3184	4822 051 10008	CHIP JUMPER 1206		
3185	4822 051 10008	CHIP JUMPER 1206		
3186	4822 051 10102	1k	2%	0,25W
3188	4822 051 10008	CHIP JUMPER 1206		
3191	4822 051 20008	CHIP JUMPER 0805		
3192	4822 051 20008	CHIP JUMPER 0805		
3197	4822 051 20472	4k7	5%	0,1W

CAPACITORS

2102	4822 124 40433	47µF	20%	25V
2106	4822 125 60102	30pF		VARIABLE
2107	4822 121 51252	470nF	5%	63V
2123	4822 121 51254	390pF	1%	400V
2125	4822 121 51381	560pF	1%	400V
2128	4822 124 41579	10µF	20%	50V
2129	4822 124 40242	1µF	20%	63V
2130	4822 126 11585	22nF	20%	50V
2133	4822 124 40242	1µF	20%	63V
2138	4822 124 41576	2,2µF	20%	50V
2140	4822 121 51252	470nF	5%	63V
2144	4822 124 40242	1µF	20%	63V
2162	4822 124 41596	22µF	20%	50V

CHIP CAPACITORS

2108	4822 122 33515	82pF	5%	50V
2109	5322 122 31946	27pF	5%	50V
2120	5322 122 32659	33pF	5%	50V
2122	5322 126 10465	3,9nF	10%	63V
2127	4822 122 32927	220nF	10%	63V
2131	4822 122 33325	470nF	20%	50V
2132	4822 122 33325	470nF	20%	50V
2134	4822 122 33128	15nF	10%	63V
2135	4822 122 32927	220nF	10%	63V
2136	4822 122 33128	15nF	10%	63V
2137	4822 122 32927	220nF	10%	63V
2141	4822 122 31947	100nF	20%	50V
2142	4822 122 31947	100nF	20%	50V
2143	4822 122 32927	220nF	10%	63V
2145	4822 122 33575	220pF	5%	50V
2147	4822 122 33575	220pF	5%	50V

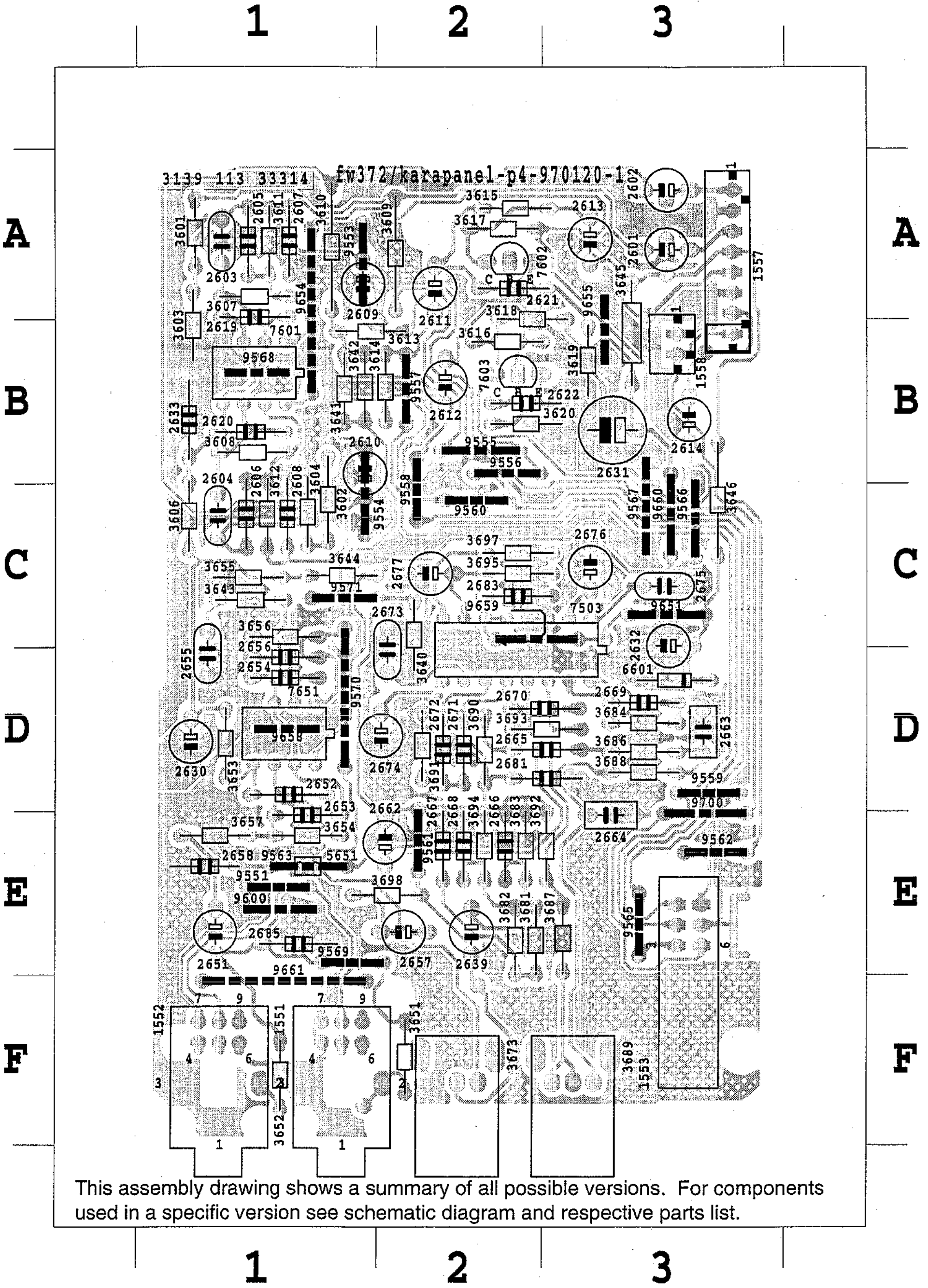
CHIP CAPACITORS

2148	4822 122 33575	220pF	5%	50V
2150	4822 122 31947	100nF	20%	50V
2158	4822 122 31947	100nF	20%	50V
2160	4822 122 32139	12pF	5%	63V
2161	5322 122 34123	1nF	10%	50V

KARAOKE BOARD

Component Layout .... 8 - 2
Circuit Diagram .... 8 - 3
Partlist .... 8 - 4

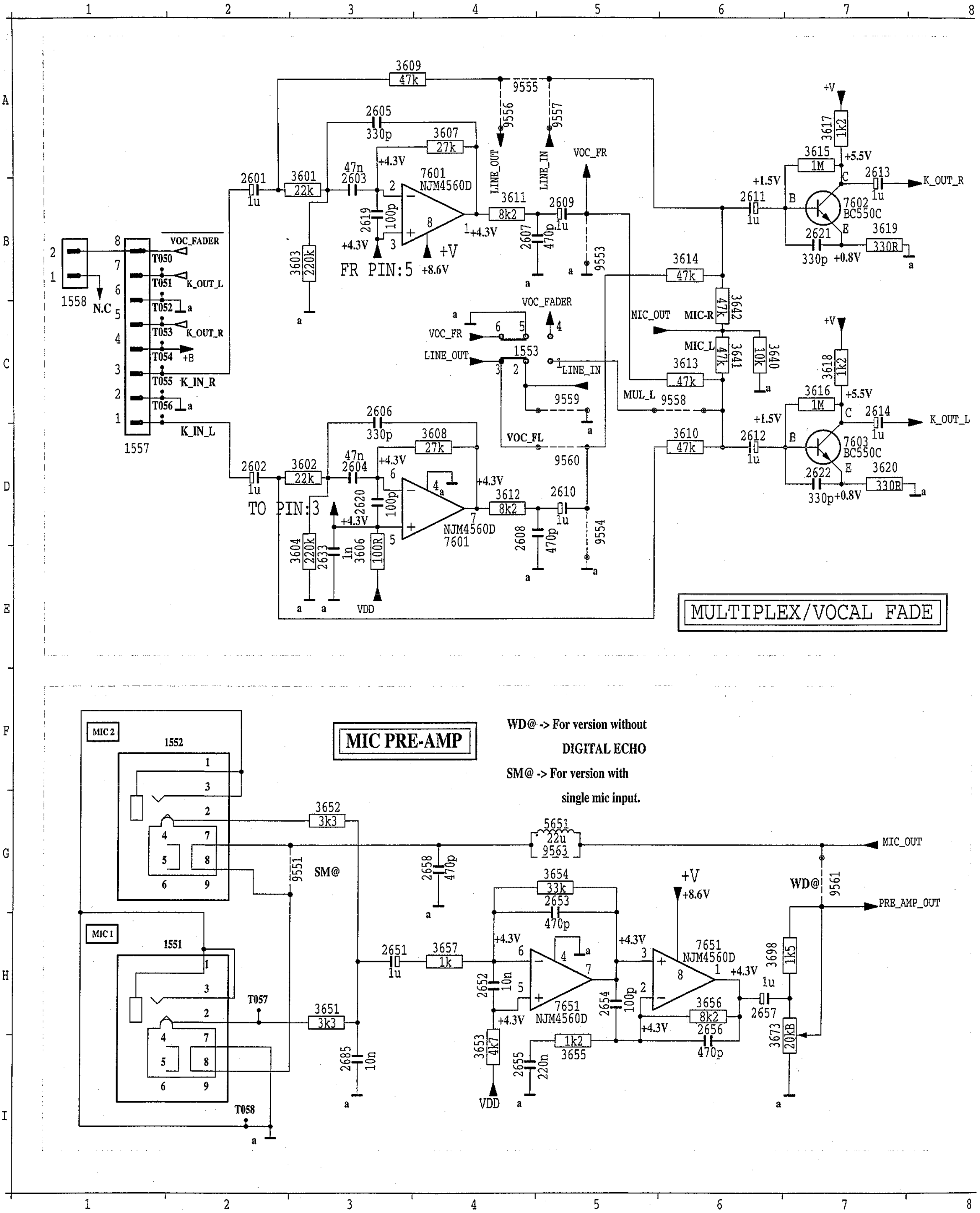
COMPONENT LAYOUT

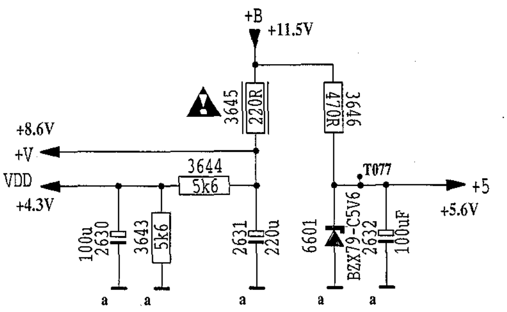


This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

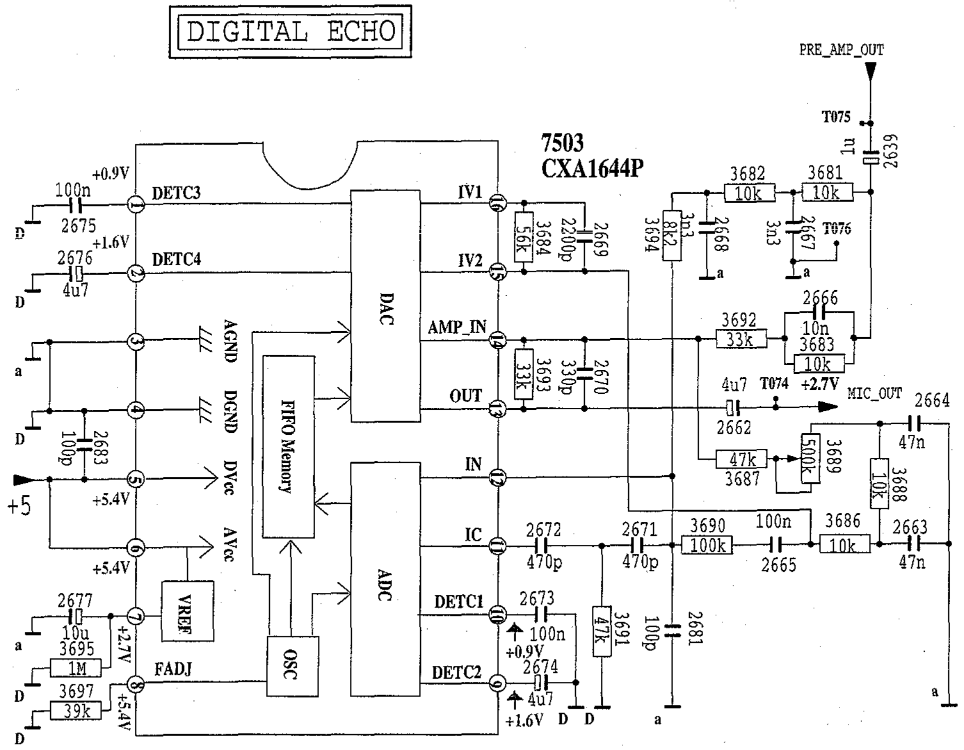
1551	F	1
1552	F	1
1553	E	3
1557	A	3
1558	B	3
2601	A	3
2602	A	3
2603	A	1
2604	C	1
2605	A	1
2606	C	1
2607	A	1
2608	C	1
2609	A	1
2610	B	1
2611	A	2
2612	B	2
2613	A	3
2614	B	3
2619	A	1
2620	B	1
2621	A	2
2622	B	2
2630	D	1
2631	B	3
2632	C	3
2633	B	1
2639	E	2
2651	E	1
2652	D	1
2653	E	1
2654	D	1
2655	D	1
2656	D	1
2657	E	2
2658	E	1
2662	E	2
2663	D	3
2664	E	3
2665	D	3
2666	E	2
2667	E	2
2668	E	2
2669	D	3
2670	D	3
2671	D	2
2672	D	2
2673	D	2
2674	D	2
2675	C	3
2676	C	3
2677	C	2
2681	D	3
2683	C	2
2685	E	1
3601	A	1
3602	C	1
3603	B	1
3604	C	1
3606	C	1
3607	A	1
3608	B	1
3609	A	2
3610	A	1
3611	A	1
3612	C	1
3613	B	1
3614	B	2
3615	A	2
3616	B	2
3617	A	2
3618	B	2
3619	B	3
3620	B	2
3640	C	2
3641	B	1
3642	B	1
3643	C	1
3644	C	1
3645	B	3
3646	C	3
3651	F	2
3652	F	1
3653	D	1
3654	E	1
3655	C	1
3656	C	1
3657	E	1
3673	F	2
3681	E	2
3682	E	2
3683	E	2
3684	D	3
3686	D	3
3687	E	3
3688	D	3
3689	F	3
3690	D	2
3691	D	2
3692	E	3
3693	D	3
3694	E	2
3695	C	2
3697	C	2
3698	E	2
5651	E	1
6601	D	3
7503	D	2
7601	B	1
7602	A	2
7603	B	2
7651	D	1
9551	E	1
9553	A	1
9554	C	1
9555	B	2
9556	B	2
9557	B	2
9558	C	2
9559	D	3
9560	C	2
9561	E	2
9562	E	3
9563	E	1
9565	E	3
9566	C	3
9567	C	3
9568	B	1
9569	E	1
9570	D	1
9571	C	1
9600	E	1
9651	C	3
9654	A	1
9655	B	3
9658	D	1
9659	C	2
9660	C	3
9661	F	1
9700	E	3

KARAOKE CIRCUIT


MULTIPLEX/VOCAL FADE
MIC PRE-AMP
WD@ -> For version without DIGITAL ECHO
SM@ -> For version with single mic input.
1558
N.C
1557
T050
T051
T052
T053
T054
T055
T056
VOC_FADER
K_OUT_L
K_OUT_R
+B
K_IN_R
K_IN_L
3609 47k
9555
9556
9557
LINE_OUT
LINE_IN
VOC_FR
2605 330p
3607 27k
2601 1u
3601 22k
47n 2603
+4.3V
7601 NJM4560D
2619 100p
3603 220k
FR PIN:5
+V
+8.6V
3611 8k2
2609 1u
2607 470p
9553
3614 47k
3642 47k
MIC_OUT
MIC-R
MIC_L
3641 47k
3640 10k
3613 47k
MUL_L
9558
1553
VOC_FL
9559
9560
2606 330p
3608 27k
2602 1u
3602 22k
47n 2604
2620 100p
TO PIN:3
3604 220k
2633 1n
3606 100R
VDD
3612 8k2
2610 1u
2608 470p
9554
3610 47k
3617 1k2
3615 1M
+5.5V
+1.5V
2613 1u
2611 1u
7602 BC550C
2621 330p
+0.8V
3619 330R
3618 1k2
3616 1M
2614 1u
2612 1u
7603 BC550C
2622 330p
3620 330R
MIC 2
MIC 1
1552
1551
3652 3k3
3651 3k3
9551
SM@
T057
T058
5651 22u
9563
2658 470p
MIC_OUT
3654 33k
2653 470p
2651 1u
3657 1k
2652 10n
7651 NJM4560D
2654 100p
3656 8k2
2656 470p
3653 4k7
3655 1k2
2655 220n
2685 10n
WD@
9561
PRE_AMP_OUT
3698 1k5
2657 1u
3673 20kB
A
B
C
D
E
F
G
H
I
1
2
3
4
5
6
7
8


+B
+11.5V
3645
220R
3646
470R
+8.6V
+V
VDD
+4.3V
3644
5k6
T077
+5
+5.6V
100u
2630
3643
5k6
2631
220u
6601
BZX79-C5V6
2632
100uF
a

MULTIPLEX	**9553, 9554, 9556, 9557, 9558**
VOCAL FADER	**9555, 9559, 9560**


DIGITAL ECHO
PRE_AMP_OUT
T075
1u
2639
7503
CXA1644P
+0.9V
100n
DETC3
2675
+1.6V
2676
4u7
DETC4
AGND
DGND
DVcc
AVcc
100p
2683
+5
+5.4V
+5.4V
2677
10u
+2.7V
VREF
3695
1M
3697
39k
FADJ
+5.4V
FIFO Memory
OSC
DAC
ADC
IV1
IV2
AMP_IN
OUT
IN
IC
DETC1
DETC2
3684
56k
2669
2200p
3693
33k
2670
330p
3682
10k
3681
10k
3694
8k2
3n3
2668
3n3
2667
T076
2666
10n
3692
33k
3683
10k
4u7
T074
+2.7V
2662
MIC_OUT
2664
47n
47k
3687
500k
3689
3688
10k
2672
470p
2671
470p
3690
100k
100n
2665
3686
10k
2663
47n
2673
100n
+0.9V
2674
4u7
+1.6V
3691
47k
100p
2681
a
D

1551	H 2
1552	F 2
1553	C 4
1557	D 1
1558	B 1
2601	B 2
2602	D 2
2603	B 3
2604	D 3
2605	A 3
2606	C 3
2607	B 4
2608	D 4
2609	B 5
2610	D 5
2611	B 6
2612	D 6
2613	A 7
2614	C 7
2619	B 3
2620	D 3
2621	B 7
2622	D 7
2630	B10
2631	B11
2632	B12
2633	E 3
2639	F14
2651	H 3
2652	H 4
2653	G 5
2654	H 5
2655	I 4
2656	H 6
2657	H 6
2658	G 4
2662	H13
2663	H14
2664	G14
2665	H13
2666	G14
2667	F13
2668	F13
2669	F12
2670	G12
2671	H12
2672	H12
2673	I12
2674	I12
2675	F 9
2676	G 9
2677	I 9
2681	I13
2683	H 9
2685	I 3
3601	B 3
3602	D 3
3603	B 3
3604	E 3
3606	E 3
3607	A 4
3608	D 4
3609	A 3
3610	D 6
3611	B 4
3612	D 4
3613	C 6
3614	B 6
3615	A 7
3616	C 7
3617	A 7
3618	C 7
3619	B 7
3620	D 7
3640	C 6
3641	C 6
3642	C 6
3643	B11
3644	B11
3645	A11
3646	A12
3651	H 3
3652	G 3
3653	I 4
3654	G 5
3655	I 5
3656	H 6
3657	H 4
3673	H 6
3681	F14
3682	F13
3683	G13
3684	F12
3686	H14
3687	H13
3688	H14
3689	H14
3690	H13
3691	I12
3692	G13
3693	G12
3694	F12
3695	I 9
3697	I 9
3698	H 6
5651	G 5
6601	B12
7503	F12
7601	A 4
7601	D 4
7602	B 7
7603	D 7
7651	H 6
7651	H 5
9551	G 2
9553	B 5
9554	D 5
9555	A 4
9556	A 4
9557	A 5
9558	C 6
9559	C 5
9560	D 5
9561	G 7
9563	G 5

ELECTRICAL PARTS LIST - KARAOKE BOARD

MISCELLANEOUS

1551	4822 267 40898	Mic Socket
1552	4822 267 40898	Mic Socket
1553	4822 276 12571	Vocal Fader Switch

CAPACITORS

2601	4822 124 40242	1µF 20% 63V
2602	4822 124 40242	1µF 20% 63V
2603	4822 121 43526	47nF 5% 250V
2604	4822 121 43526	47nF 5% 250V
2605	4822 126 12787	330pF 10% 50V
2606	4822 126 12787	330pF 10% 50V
2607	4822 122 33519	470pF 10% 50V
2608	4822 122 33519	470pF 10% 50V
2609	4822 124 40242	1µF 20% 63V
2610	4822 124 40242	1µF 20% 63V
2611	4822 124 40242	1µF 20% 63V
2612	4822 124 40242	1µF 20% 63V
2613	4822 124 40242	1µF 20% 63V
2614	4822 124 40242	1µF 20% 63V
2619	4822 122 33195	100pF 10% 50V
2620	4822 122 33195	100pF 10% 50V
2621	4822 126 12787	330pF 10% 50V
2622	4822 126 12787	330pF 10% 50V
2630	4822 124 41584	100µF 20% 10V
2631	4822 124 80144	220µF 20% 25V
2631	4822 124 22263	220µF 20% 25V
2632	4822 124 41584	100µF 20% 10V
2633	4822 122 33197	1nF 10% 50V
2639	4822 124 40242	1µF 20% 63V
2651	4822 124 40242	1µF 20% 63V
2652	4822 121 51387	10nF 20% 16V
2653	4822 122 33519	470pF 10% 50V
2654	4822 122 33195	100pF 10% 50V
2655	4822 121 42408	220nF 5% 63V
2656	4822 122 33519	470pF 10% 50V
2657	4822 124 40242	1µF 20% 63V
2658	4822 122 33519	470pF 10% 50V
2662	4822 124 40246	4,7µF 20% 63V
2663	4822 121 43526	47nF 5% 250V
2664	4822 121 43526	47nF 5% 250V
2665	4822 126 12882	100nF +80-20% 50V
2666	4822 121 51387	10nF 20% 16V
2667	4822 122 10577	3,3nF 10% 16V
2668	4822 122 10577	3,3nF 10% 16V
2669	4822 126 12339	2200pF 10%
2670	4822 126 12787	330pF 10% 50V
2671	4822 122 33519	470pF 10% 50V
2672	4822 122 33519	470pF 10% 50V
2673	5322 121 42386	100nF 5% 63V
2674	4822 124 40246	4,7µF 20% 63V
2675	5322 121 42386	100nF 5% 63V
2676	4822 124 40246	4,7µF 20% 63V
2677	4822 124 41579	10µF 20% 50V
2681	4822 122 33195	100pF 10% 50V
2683	4822 122 33195	100pF 10% 50V
2685	4822 121 51387	10nF 20% 16V

RESISTORS

3601	4822 116 52257	22k 5% 0,5W
3602	4822 116 52257	22k 5% 0,5W
3603	4822 116 83874	220k 5% 0,5W
3604	4822 116 83874	220k 5% 0,5W
3606	4822 116 52175	100R 5% 0,5W
3607	4822 116 52264	27k 5% 0,5W
3608	4822 116 52264	27k 5% 0,5W
3609	4822 116 83884	47k 5% 0,5W
3610	4822 116 83884	47k 5% 0,5W
3611	4822 116 52303	8k2 5% 0,5W
3612	4822 116 52303	8k2 5% 0,5W
3613	4822 116 83884	47k 5% 0,5W
3614	4822 116 83884	47k 5% 0,5W
3615	4822 116 52235	1M 5% 0,5W
3616	4822 116 52235	1M 5% 0,5W
3617	4822 116 52207	1k2 5% 0,5W
3617	4822 116 52249	1k8 5% 0,5W (DPL version)
3618	4822 116 52207	1k2 5% 0,5W
3618	4822 116 52249	1k8 5% 0,5W (DPL version)
3619	4822 116 52219	330R 5% 0,5W
3619	4822 116 83883	470R 5% 0,5W (DPL version)
3620	4822 116 52219	330R 5% 0,5W
3620	4822 116 83883	470R 5% 0,5W (DPL version)
3640	4822 116 83864	10k 5% 0,5W
3641	4822 116 83884	47k 5% 0,5W
3642	4822 116 83884	47k 5% 0,5W
3643	4822 116 52289	5k6 5% 0,5W
3644	4822 116 52289	5k6 5% 0,5W
3645	4822 052 10221 ⚠	220R 5% 0,33W
3646	4822 116 83883	470R 5% 0,5W
3651	4822 116 52269	3k3 5% 0,5W
3652	4822 116 52269	3k3 5% 0,5W
3653	4822 116 52283	4k7 5% 0,5W
3654	4822 116 52271	33k 5% 0,5W
3655	4822 116 52207	1k2 5% 0,5W
3656	4822 116 52303	8k2 5% 0,5W
3656	4822 116 52264	27k 5% 0,5W (DPL version)
3657	4822 050 11002	1k 1% 0,4W
3673	4822 101 21204	Potm Rotary 20kB
3681	4822 116 83864	10k 5% 0,5W
3682	4822 116 83864	10k 5% 0,5W
3683	4822 116 83864	10k 5% 0,5W
3684	4822 116 52291	56k 5% 0,5W
3686	4822 116 83864	10k 5% 0,5W
3687	4822 116 83884	47k 5% 0,5W
3688	4822 116 83864	10k 5% 0,5W

ELECTRICAL PARTS LIST - KARAOKE BOARD

3689	4822 101 11326	Potm Rotary 500k
3690	4822 116 52234	100k 5% 0,5W
3691	4822 116 83884	47k 5% 0,5W
3692	4822 116 52271	33k 5% 0,5W
3693	4822 116 52271	33k 5% 0,5W
3694	4822 116 52303	8k2 5% 0,5W
3695	4822 116 52235	1M 5% 0,5W
3697	4822 116 83882	39k 5% 0,5W
3698	4822 116 52243	1k5 5% 0,5W

COILS

5651	4822 157 52983	COIL 22μH

DIODES

6601	4822 130 34173	BZX79-C5V6

TRANSISTORS & INTEGRATED CIRCUITS

7503	4822 209 33717	CXA1644P
7601	4822 209 83274	NJM4560D
7602	4822 130 41096	BC550C
7603	4822 130 41096	BC550C
7651	4822 209 83274	NJM4560D

NOTE: Only the parts mentioned in this list are normal service spare parts.

ETF2 TAPE MODULE

TABLE OF CONTENTS

Tape Module Wiring 9-1
Block diagram 9-2
General description & connector assignment 9-3
Tape adjustments 9-5
ETF2 Circuits I & II 9-6
Component & Chip Layout 9-8
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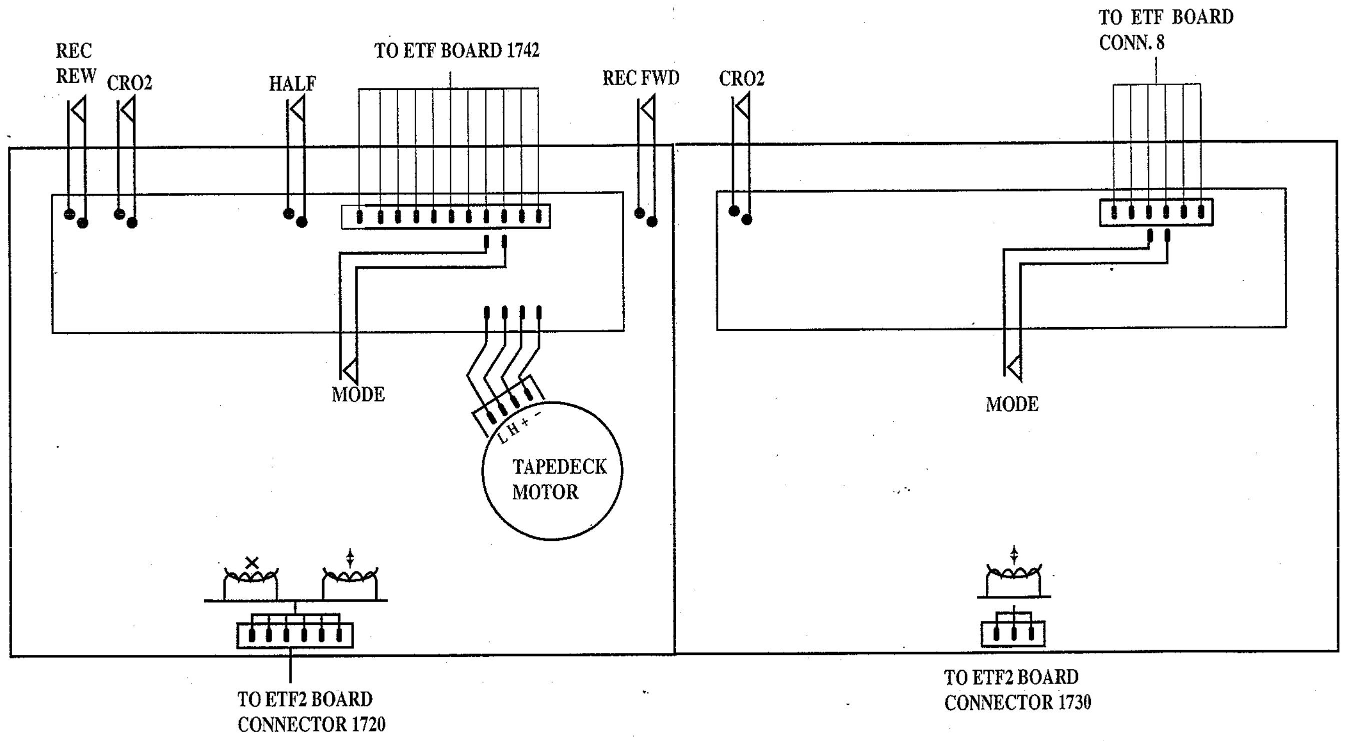
Exploded views & parts list 9-10
Electrical parts list 9-13

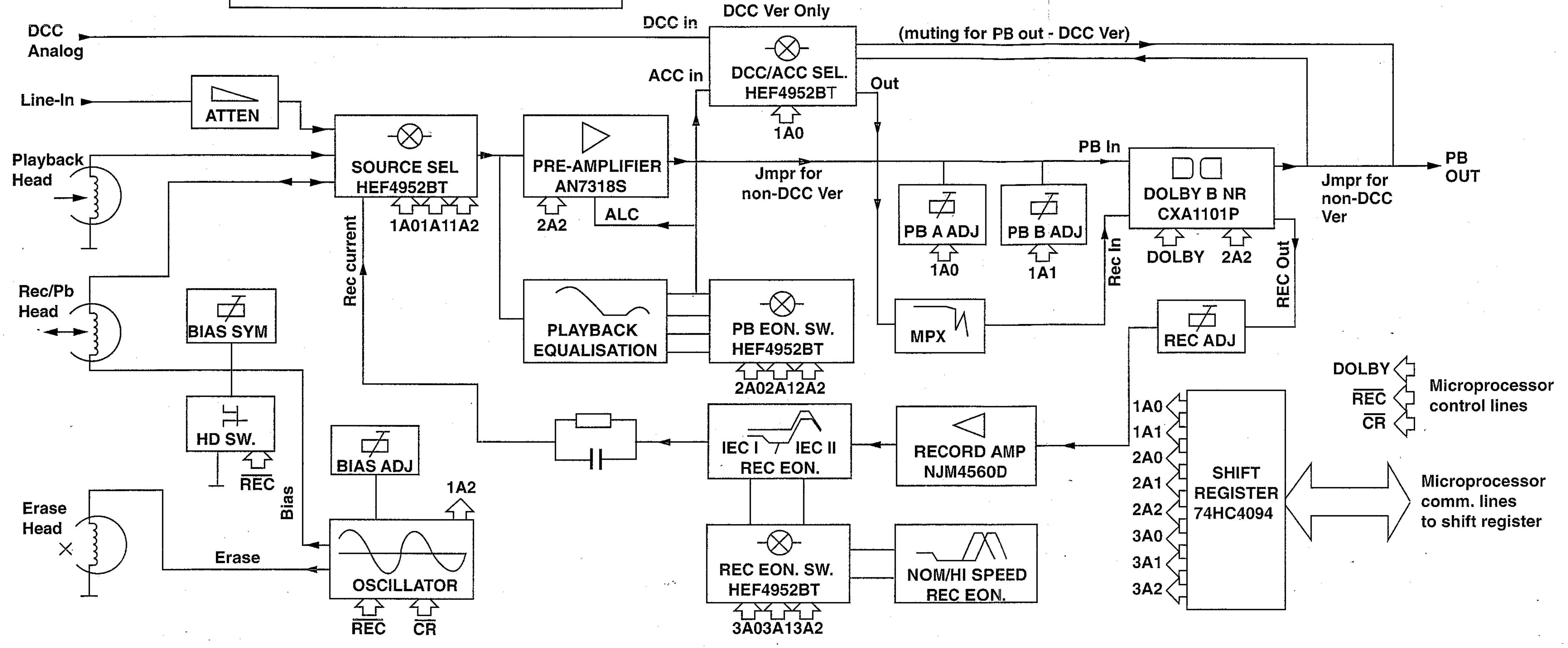
Tapedeck wiring (Double deck)



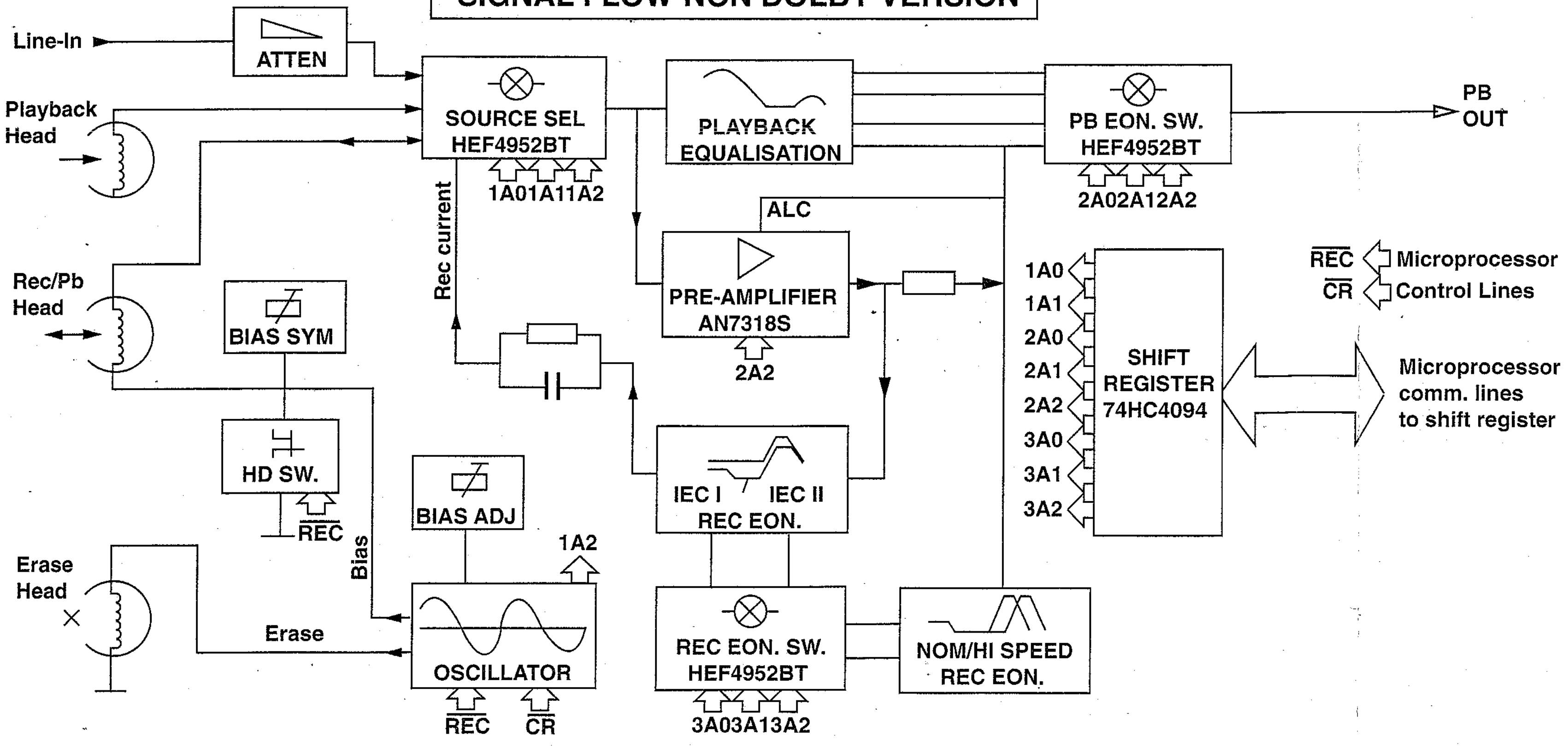
REC
REW
CRO2
HALF
TO ETF BOARD 1742
REC FWD
CRO2
TO ETF BOARD
CONN. 8
MODE
L H + -
TAPEDECK
MOTOR
MODE
TO ETF2 BOARD
CONNECTOR 1720
TO ETF2 BOARD
CONNECTOR 1730

ETF 2 BLOCK DIAGRAM

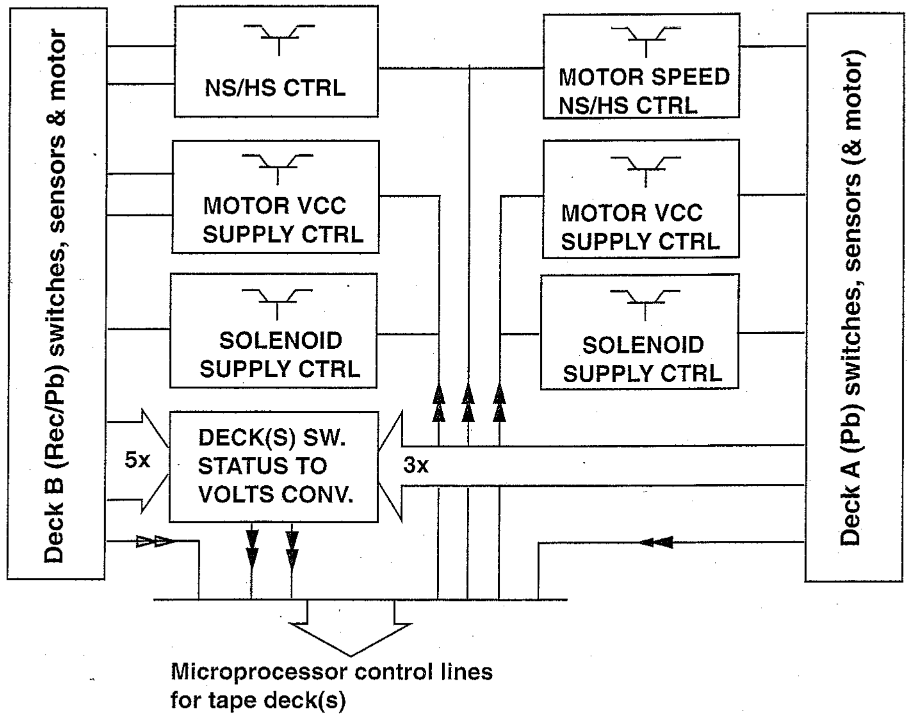
SIGNAL FLOW-DOLBY VERSION


DCC Analog
DCC in
DCC Ver Only
(muting for PB out - DCC Ver)
ACC in
DCC/ACC SEL.
HEF4952BT
Out
1A0
Line-In
ATTEN
Playback Head
SOURCE SEL
HEF4952BT
1A01A11A2
PRE-AMPLIFIER
AN7318S
2A2
ALC
Jmpr for non-DCC Ver
PB In
PB A ADJ
1A0
PB B ADJ
1A1
DOLBY B NR
CXA1101P
DOLBY
2A2
Jmpr for non-DCC Ver
PB OUT
Rec In
REC Out
Rec current
Rec/Pb Head
BIAS SYM
PLAYBACK EQUALISATION
PB EON. SW.
HEF4952BT
2A02A12A2
MPX
REC ADJ
DOLBY
REC
CR
Microprocessor control lines
HD SW.
REC
BIAS ADJ
1A2
Bias
IEC I
IEC II
REC EON.
RECORD AMP
NJM4560D
1A0
1A1
2A0
2A1
2A2
3A0
3A1
3A2
SHIFT REGISTER
74HC4094
Microprocessor comm. lines to shift register
Erase Head
Erase
OSCILLATOR
REC
CR
REC EON. SW.
HEF4952BT
3A03A13A2
NOM/HI SPEED REC EON.

SIGNAL FLOW-NON DOLBY VERSION


Line-In
ATTEN
Playback Head
SOURCE SEL
HEF4952BT
1A01A11A2
PLAYBACK EQUALISATION
PB EON. SW.
HEF4952BT
2A02A12A2
PB OUT
Rec current
ALC
Rec/Pb Head
BIAS SYM
PRE-AMPLIFIER
AN7318S
2A2
1A0
1A1
2A0
2A1
2A2
3A0
3A1
3A2
SHIFT REGISTER
74HC4094
REC
CR
Microprocessor Control Lines
Microprocessor comm. lines to shift register
HD SW.
REC
BIAS ADJ
1A2
Bias
IEC I
IEC II
REC EON.
Erase Head
Erase
OSCILLATOR
REC
CR
REC EON. SW.
HEF4952BT
3A03A13A2
NOM/HI SPEED REC EON.

TAPE DECK(S) INTERFACE PART


Deck B (Rec/Pb) switches, sensors & motor
NS/HS CTRL
MOTOR VCC SUPPLY CTRL
SOLENOID SUPPLY CTRL
DECK(S) SW. STATUS TO VOLTS CONV.
5x
3x
MOTOR SPEED NS/HS CTRL
MOTOR VCC SUPPLY CTRL
SOLENOID SUPPLY CTRL
Deck A (Pb) switches, sensors (& motor)
Microprocessor control lines for tape deck(s)

GENERAL DESCRIPTION

FEATURES

The ETF-2 is a family of logic controlled, electronically switched tape function modules. Each module comprises a logic controlled tape deck with attached pcb housing the tape pre-amplifier, recording and switching circuitry, and tape deck interface circuitry.

The following features are available as options:
single / double tape-deck applications
auto-reverse / single way deck options
single / double motor options for double deck
IEC I & IEC II tape types auto selection for playback & recording
Dolby B type Noise Reduction
line-in recording with pilot suppression
tape dubbing at normal & high speed (for double deck applications)
automatic recording level control
software controlled full auto reverse permutations
opto-reflector disc for counter pulses & end-of-tape (EOT) auto-stop
input for DCC deck analog playpack output

NOTATIONS & ABBREVIATIONS USED IN THIS DOCUMENT

Gnd x	Ground x
S/A	Sub-assy
FE	Ferro (IEC type I)
CR	Chrome (IEC type II)
NR	Noise Reduction
PB	Playback
REC	Record
NSD	Normal speed dubbing
HSD	High speed dubbing
DD	Double Deck
SD	Single Deck
SM	Single Motor
DM	Double Motor
ND	Non Dolby
DB	Dolby B

PC board variations 12NCs (3139 118 ...)	**ND/SD** ... 85990	**ND/DD/FF** ... 88910	**DB/DD/FR** ... 88750	**DB/DD/FF** ... 89960
Deck configuration	Single	Double	Double	Double
Motor configuration	Single	Single	Single	Single
Auto Fe/Cr02 selection	Yes	Yes	Yes	Yes
Dolby B	No	No	Yes	Yes
19kHz suppression	No	No	Yes	Yes
High speed dubbing	No	Yes	Yes	Yes
Audio I/P for DCC sets	No	No	No	No

Note: ND - Non Dolby, DB - Dolby B
SD - Single Deck, DD - Double Deck
FF - Playback + Rec/Playback
FR - Playback + Auto-reverse Rec/Playback

CONNECTORS ASSIGNMENTS:

CONNECTOR 1701   AF SIGNAL & SUPPLY CONNECTIONS

○	1	-CMOS	Negative d.c. supply (-9V) for CMOS ICs
○	2	TAPE-L	Playback output left
○	3	TAPE-R	Playback output right
○	4	+12V	D.C. supply (+12V) for AF electronics
○	5	GND A	AF Ground
○	6	REC-L	Record input left
○	7	REC-R	Record input right

CONNECTOR 1702   CONTROL LINES FOR AF ELECTRON ***(For NON-Dolby versions only)***

○	1	STROBE	HEF4094BT shift register Strobe line	
○	2	DATA	HEF4094BT shift register Data line	
○	3	CLK	HEF4094BT shift register Clock line	
○	4	GND P	Control & Oscillator Ground	
○	5	REC'	Record on/off control	(+5V=Pb; 0V=Rec)
○	6	CRO2'	CrO2 tape recording control	(+5V=Fe; 0V=Cr)

CONNECTOR 1705   DCC DECK CONNECTORS ***(For versions with inputs for DCC Analog Playback)***

○	1	ACC L	DCC Deck analog playback left
○	2	GND A	AF Ground
○	3	ACC R	DCC Deck analog playback right

CONNECTOR 1706   CONTROL LINES FOR AS ELECTRON ***(For versions with Dolby only)***

○	1	STROBE	HEF4094BT shift register Strobe line	
○	2	DATA	HEF4094BT shift register Data line	
○	3	CLK	HEF4094BT shift register Clock line	
○	4	GND P	Control & Oscillator Ground	
○	5	REC'	Record on/off control	(+5V=Pb; 0V=Rec)
○	6	CRO2'	CrO2 tape recording control	(+5V=Fe; 0V=Cr)
○	7	DOLBY'	Dolby NR on/off control (option)	(+5V=off; 0V=On)

CONNECTOR 1711   BIAS CURRENT SENSO ***(For Testing purpose only)***

○	1	BIAS L+	Bias current test connector - left channel
○	2	BIAS L-	Bias current test connector - left channel
○	3	BIAS R+	Bias current test connector - right channel
○	4	BIAS R-	Bias current test connector - right channel

CONNECTOR 1720   DECK B HEADS CONNECTON ***(JQ top-type)***

○	1	B R/P HD L+	R/P Head left channel positive
○	2	B R/P HD L-	R/P Head left channel negative
○	3	B R/P HD R+	R/P Head right channel positive
○	4	B R/P HD R-	R/P Head right channel negative
○	5	ERASE HEAD	Erase Head
○	6	GND P	Erase Head ground

CONNECTOR 1730

DECK A HEAD CONNECTIONS ***(For Double Deck versions only)***

○	1	A PB HD R+	Pb Head right channel positive
○	2	GND A	Pb Head return ground shield
○	3	A PB HD L+	Pb Head left channel positive

5.2 TAPE DECK INTERFACES

CONNECTOR 1703

MOTOR SUPPLY LINES ***(PH side-type)***

○	1	+MOTOR	D.C. supply (+12V) for tape deck motor & solenoid
○	2	GND P	Motor Ground

CONNECTOR 1704

CONTROL LINES FOR TAPE DECK OPERATE ***(PH side-type)***
(For single Deck versions only)

○	1	GND	Ground for deck sensing switches network (provision)
○	2	+5V	D.C. supply (+5V) for deck status ADC network (referenced to micro-p)
○	3	AD1	Deck B sensing switches output voltage
○	4	EOT B	Deck B EOT/counter pulse
○	5	SOLB/MOTB*	Deck B motor/solenoid control (tri-state; see table below)
○	6	AD2	Deck A sensing switches output voltage

CONNECTOR 1707

CONTROL LINES FOR TAPE DECK OPERATE ***(PH side-type)***
(For Double Deck versions only)

○	1	GND	Ground for deck sensing switches network (provision)
○	2	+5V	D.C. supply (+5V) for deck status ADC network (referenced to micro-p)
○	3	AD1	Deck B sensing switches output voltage
○	4	EOT B	Deck B EOT/counter pulse
○	5	SOLB/MOTB*	Deck B motor/solenoid control (tri-state; see table below)
○	6	AD2	Deck A sensing switches output voltage
○	7	EOT A	Deck A EOT/counter pulse
○	8	SOLA/MOTA*	Deck A motor/solenoid control (tri-state; see table)
○	9	AD3	Deck A sensing switches output voltage
○	10	NS/HS	Normal/high speed toggle (+5V=HS; 0V=NS)

* motor/solenoid tristate ctrl lines

	mot	sol
0V	on	on
Hi-Z	on	off
5V	off	off

CONNECTOR 1741

DECK B CONTROL INTERFACE
(For Single Deck versions only)

○	1	GND	Deck/Motor ground
○	2	MODE	Mode switch (head engagement)
○	3	Vcc	Deck/Motor supply
○	4	SOL B	Solenoid supply
○	5	PHOTO B	Photo sensor output (tape movement indication)
○	6	CrO2	Chrome tape detection switch
○	7	HALF	Half switch (cassette present detection, provision only)
○	8	REC FWD	Record tab protection status switch (forward)
○	9	REC RVS	Record tab protection status switch (reverse)

CONNECTOR 1742 DECK B CONTROL INTERFACE

(For Double Deck versions only)

○	1	H	H pin for motor
○	2	L	L pin for motor
○	3	GND	Deck/Motor ground
○	4	MODE	Mode switch (head engagement)
○	5	Vcc	Deck/Motor supply
○	6	SOL B	Solenoid supply
○	7	PHOTO B	Photo sensor output (tape movement indication)
○	8	CrO2	Chrome tape detection switch
○	9	HALF	Half switch (cassette present detection, provision only)
○	10	REC FWD	Record tab protection status switch (forward)
○	11	REC RVS	Record tab protection status switch (reverse)

CONNECTOR 1743 DECK A CONTROL INTERFAC ***(XH wire-type on dip-mate item 8)***

(For Double Deck/Single Motor versions only)

○	1	HALF	Half switch (cassette present detection, provision only)
○	2	CrO2	Chrome tape detection switch
○	3	PHOTO A	Photo sensor output (tape movement indication)
○	4	SOL A	Solenoid supply
○	5	Vcc	Deck/Motor supply
○	6	MODE	Mode switch (head engagement)
○	7	GND	Deck/Motor ground

CONNECTOR 1744 DECK A CONTROL INTERFAC ***(XH wire-type on dip-mate item 8 & 9)***

(For Double Deck/Double Motor versions only)

○	1	HALF	Half switch (cassette present detection, provisiion only)
○	2	CrO2	Chrome tape detection switch
○	3	PHOTO A	Photo sensor output (tape movement indication)
○	4	SOL A	Solenoid supply
○	5	Vcc	Deck/Motor supply
○	6	MODE	Mode switch (head engagement)
○	7	GND	Deck/Motor ground

○	1	L	L pin for motor
○	2	H	H pin for motor

SUPPLY	**DESCRIPTION**	**VOLTAGE**
+12V	d.c. supply for AF electronics	+12V
+CMOS	d.c. supply for CMOS ICs	-9V
+MOTOR	d.c. supply for tape deck motor and solenoid	+12V
+5V	d.c. supply for deck status ADC network	+5V

General

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST	
					with	to
ADJUST MOTOR SPEED						
HIGH SPEED	SBC420 (4822 397 30071) 3150Hz	DUBBING	10 or 11 LEFT RIGHT	frequency counter	3682	5040Hz±0.5%
NORMAL		PLAY			3684	3150Hz±0.5%
CHECK WOW & FLUTTER (DECK1 AND DECK2)						
WOW FLUTTER	SBC420 (4822 397 30071) 3150Hz	PLAY	10 or 11 LEFT RIGHT	W&F-meter	check only	≤0.6 % unwtd.
ADJUST AZIMUTH (DECK1 AND DECK2)						
NORM. DIRECTION	SBC420 (4822 397 30071) 10kHz	PLAY FWD	10 or 11 LEFT RIGHT	mV-meter	left hand screw	max. output level & left=right
REV. DIRECTION		PLAY REV			right hand screw	

Playback

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST	
					with	to
ADJUST DOLBY PLAYBACK LEVEL						
DECK1	DOLBY REF. (4822 397 30271) 200nWb/m	PLAY	10 or 11 LEFT RIGHT	mV-meter	3641(L), 3642(R)	535mV ±0.5dB
DECK2					3635(L), 3636(R)	
CHECK PLAYBACK FREQUENCY RESPONSE (DECK1 AND DECK2)						
PB FREQU. RESP.	SBC420 (4822 397 30071)	PLAY	10 or 11 LEFT RIGHT	mV-meter	mV-meter	limits see fig.1

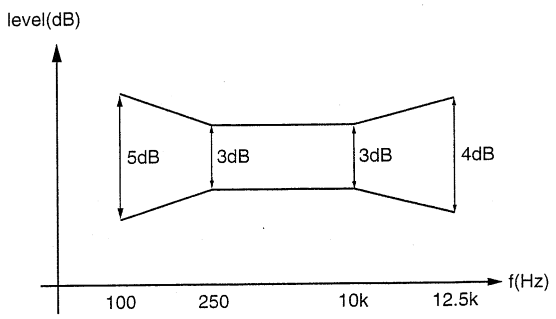


fig. 1

Recording

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST	
					with	to
PRE-ADJUST BIAS AND BIAS-SYMMETRY						
CrO_2	CrO_2	RECORD	12 or 13 LEFT RIGHT	mV-meter	3773 & 3785	110mV & left=right
FERRO	FERRO	RECORD			check only	71mV ±0.5dB
CHECK OVERALL FREQUENCY RESPONSE AND DISTORTION						
37mV at AUX-IN 100Hz,250Hz,1kHz 10kHz,12.5kHz	CrO_2	RECORD				
	RECORDED CASSETTE	PLAY	10 or 11 LEFT RIGHT	mV-meter	check only	limits see fig.2
100mV at AUX-IN, 1kHz	CrO_2	RECORD				
	RECORDED CASSETTE	PLAY	10 or 11 LEFT RIGHT	THD-meter	check only	≤3%
Remark: If high frequencies are not within limits, decrease bias and remeasure. If distortion is too high increase bias and remeasure.						
ADJUST DOLBY RECORD LEVEL						
AUX-IN	CrO_2	RECORD	10 or 11 LEFT RIGHT	mV-meter	LF-generator	330Hz 170mV
	CrO_2	RECORD	12 or 13 LEFT RIGHT	mV-meter	3655 & 3556	5mV 1)
1) Remark: Use low pass filter to attenuate the bias component, or short-circuit base of 7783 to ground.						
RECORD LEVEL CHECK						
	RECORDED CASSETTE	PLAY	10 or 11 LEFT RIGHT	mV-meter	check only	330Hz 170mV ±0.5dB
Remark: If measured value is out of limit, re-adjust record level and remeasure.						

Note : The adjustment and check table are for all options/variants. For your exact application , please refer to the Options/Variants Table.

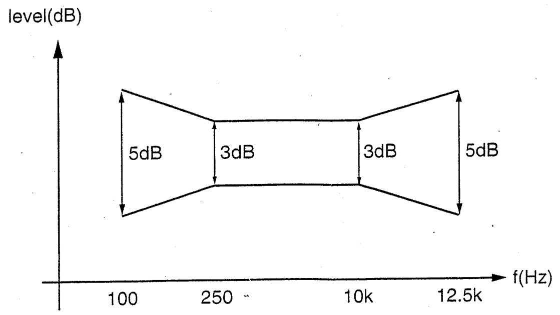
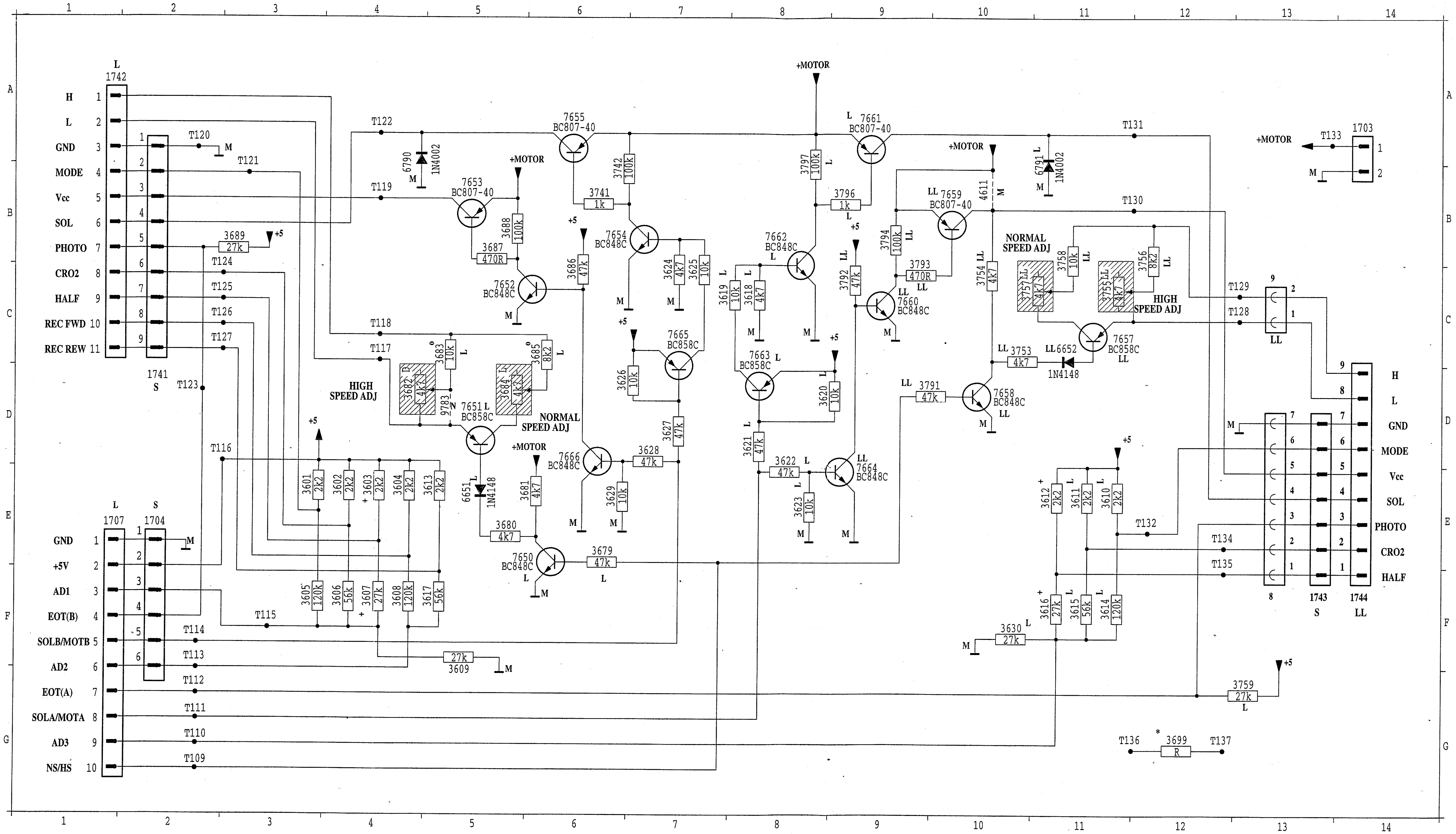


fig. 2

ETF2 CIRCUIT I


1742
H
L
GND
MODE
Vcc
SOL
PHOTO
CRO2
HALF
REC FWD
REC REW
1741
S
1707
1704
GND
+5V
AD1
EOT(B)
SOLB/MOTB
AD2
EOT(A)
SOLA/MOTA
AD3
NS/HS
+MOTOR
HIGH SPEED ADJ
NORMAL SPEED ADJ
7655 BC807-40
7661 BC807-40
7653 BC807-40
7659 BC807-40
7652 BC848C
7654 BC848C
7662 BC848C
7660 BC848C
7651 BC858C
7665 BC858C
7663 BC858C
7657 BC858C
7658 BC848C
7666 BC848C
7664 BC848C
7650 BC848C
6790 1N4002
6791 1N4002
6651 1N4148
6652 1N4148
1703
1743
1744
S
LL
3699 R
T136
T137

1703	A14	T109	G 2
1704	E 2	T110	G 2
1707	E 2	T111	G 2
1741	D 2	T112	G 2
1742	A 2	T113	F 2
3601	E 3	T114	F 2
3602	E 4	T115	F 3
3603	E 4	T116	D 2
3604	E 4	T117	C 4
3605	F 3	T118	C 4
3606	F 4	T119	B 4
3607	F 4	T120	A 2
3608	F 4	T121	A 3
3610	E11	T122	A 4
3611	E11	T123	D 2
3612	E11	T124	B 2
3613	E 5	T125	C 2
3614	F11	T126	C 2
3615	F11	T127	C 2
3616	F11	T128	C13
3617	F 5	T129	C13
3618	C 8	T130	B11
3619	C 7	T131	A11
3620	D 8	T132	E12
3621	D 8	T133	A13
3622	D 8	T134	E12
3623	E 8	T135	E12
3624	C 7	T136	G11
3625	C 7	T137	G12
3626	D 6		
3627	D 7		
3628	D 7		
3629	E 6		
3679	E 6		
3680	E 5		
3681	E 6		
3682	D 4		
3683	C 5		
3684	D 5		
3685	C 6		
3686	C 6		
3687	B 5		
3688	B 5		
3689	B 3		
3699	G12		
3741	B 6		
3742	B 6		
3753	C10		
3754	C10		
3755	C11		
3756	B12		
3757	C10		
3758	B11		
3759	G13		
3791	D 9		
3792	C 9		
3793	C 9		
3794	B 9		
3796	B 9		
3797	A 8		
4611	B10		
6651	E 5		
6652	C11		
6790	A 4		
6791	A11		
7650	E 6		
7651	D 5		
7652	C 5		
7653	B 5		
7654	B 6		
7655	A 6		
7657	C11		
7658	D10		
7659	B10		
7660	C 9		
7661	A 9		
7662	B 8		
7663	C 8		
7664	E 9		
7665	C 7		
7666	D 6		
8	F13		
9	C13		
9783	D 5		

S	Required for sets with Single-Deck only
N	Required for sets with Non-Dolby/Double-Deck only
D	Required for sets with Dolby/Double-Deck only
L	Required for sets with Double-Deck only
M	Required for sets with Double-Deck/Single-Motor only
LL	Required for sets with Double-Deck/Double-Motor only
+	For provision only

* For Variants detection during PCB testing :

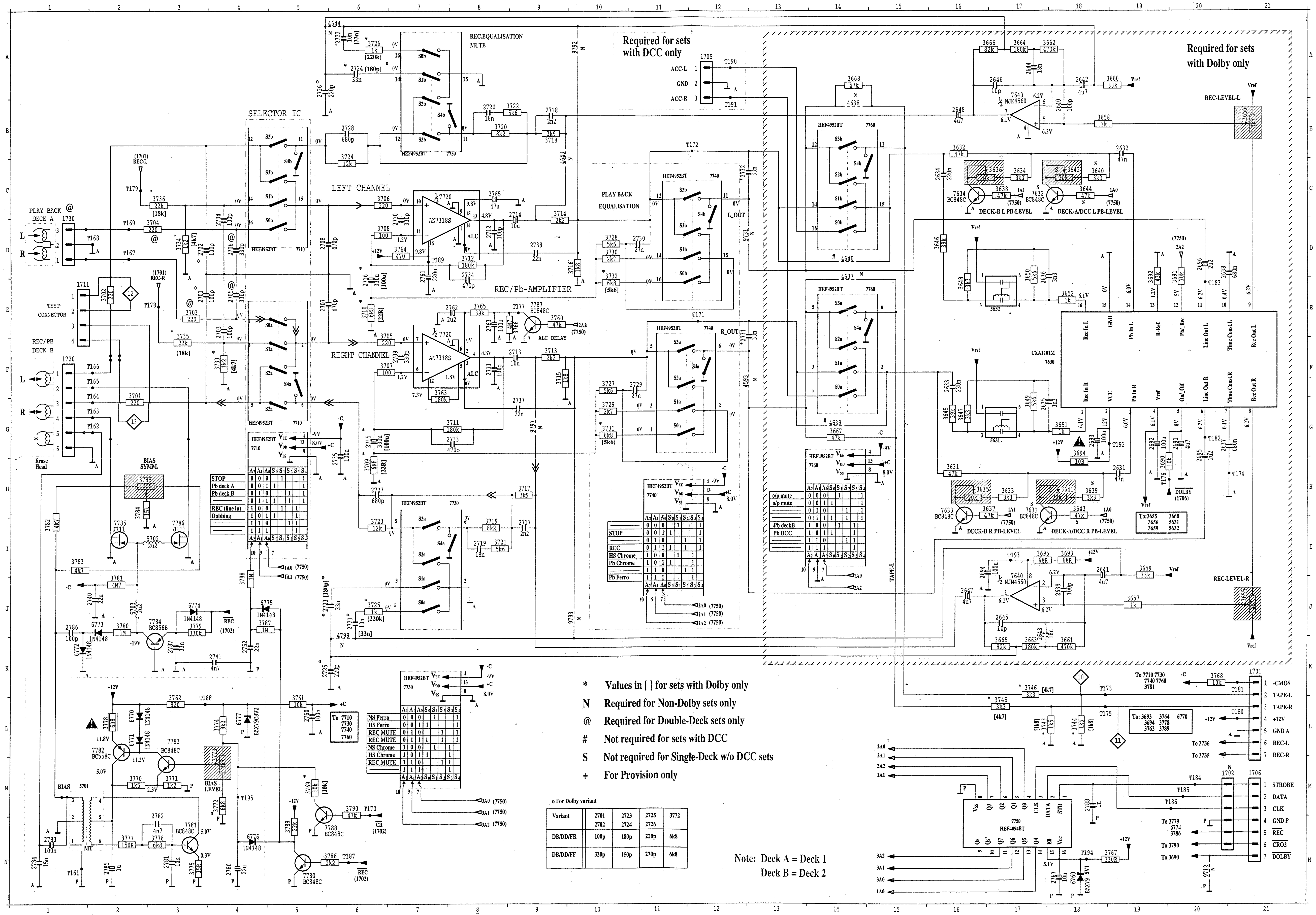
Values for Resistor 3699

1	ND/SD	1k
2	DB/SD	2k2
3	ND/DD/FR	3k3
4	DB/DD/FR	5k6
5	DB/DD/RR	5k6
6	DB/DD/DM	6k8

o For Dolby variant,

3683	DB/DD/FR	8k2
	DB/DD/FF	6k8
3685	DB/DD/FR	10k

ETF2 CIRCUIT II

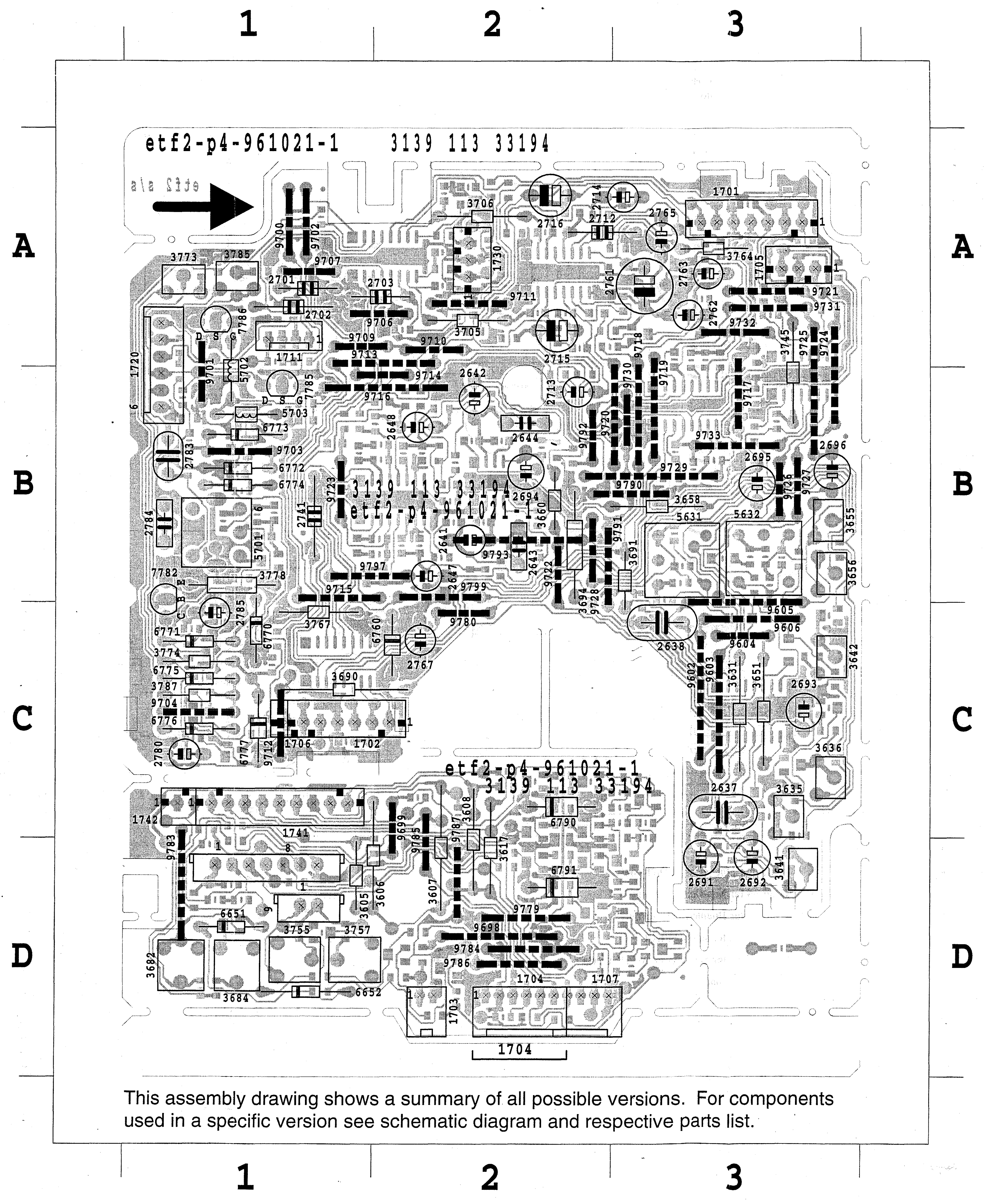

SELECTOR IC
LEFT CHANNEL
RIGHT CHANNEL
REC/Pb-AMPLIFIER
REC.EQUALISATION MUTE
PLAY BACK EQUALISATION
Required for sets with DCC only
Required for sets with Dolby only
PLAY BACK DECK A
REC/PB DECK B
TEST CONNECTOR
Erase Head
BIAS SYMM.
BIAS LEVEL
REC-LEVEL-L
REC-LEVEL-R
DECK-B L PB-LEVEL
DECK-A/DCC L PB-LEVEL
DECK-B R PB-LEVEL
DECK-A/DCC R PB-LEVEL
CXA1101M
HEF4952BT
HEF4094BT
AN7318S
NJM4560
-CMOS
TAPE-L
TAPE-R
+12V
GND A
REC-L
REC-R
STROBE
DATA
CLK
GND P
REC
CRO2
DOLBY
* Values in [ ] for sets with Dolby only
N Required for Non-Dolby sets only
@ Required for Double-Deck sets only
# Not required for sets with DCC
S Not required for Single-Deck w/o DCC sets
+ For Provision only
Note: Deck A = Deck 1
Deck B = Deck 2

o For Dolby variant

Variant	2701 2702	2723 2724	2725 2726	3772
DB/DD/FR	100p	180p	220p	6k8
DB/DD/FF	330p	150p	270p	6k8

1701	K21	3732	D10
1702	M20	3733	F 4
1705	A12	3734	D 3
1706	M21	3735	E 3
1711	E 1	3736	C 3
1720	F 1	3743	L17
1730	D 1	3744	L18
2631	H19	3745	L17
2632	B19	3746	K17
2633	F16	3760	E 9
2634	C16	3761	L 5
2635	G17	3762	L 3
2636	D17	3763	F 7
2637	G20	3764	D 7
2638	D20	3765	E 8
2639	J18	3766	E 9
2640	B18	3767	N19
2641	I18	3768	K20
2642	A18	3769	M 5
2643	J17	3770	M 2
2644	A17	3771	M 3
2645	J17	3772	M 4
2646	A17	3773	L 4
2647	J16	3774	L 4
2648	B16	3775	N 3
2691	G20	3776	N 3
2692	G19	3777	N 2
2693	G18	3778	L 2
2694	I16	3779	J 3
2695	G20	3780	J 2
2696	D20	3781	J 2
2701	E 3	3782	I 1
2702	D 3	3783	I 1
2703	E 4	3784	H 2
2704	D 4	3785	H 2
2705	E 4	3786	N 6
2706	D 4	3787	J 4
2707	E 5	3788	J 4
2708	D 5	3789	N 5
2709	F 7	3790	M 6
2710	D 7	4593	F12
2711	F 8	4637	E14
2712	D 8	4638	B14
2713	F 9	4639	G14
2714	C 9	4640	D14
2715	G 6	4643	B 9
2716	E 6	4644	A 6
2717	I 9	4799	K 6
2718	B 9	5631	G17
2719	I 8	5632	E17
2720	B 8	5701	M 1
2721	J 6	5702	I 3
2722	A 6	5703	J 2
2723	J 5	6760	N18
2724	A 6	6770	L 2
2725	K 5	6771	L 2
2726	A 5	6772	K 1
2727	H 6	6773	J 2
2728	B 6	6774	J 3
2729	F11	6775	J 4
2730	D11	6776	N 4
2731	E12	6777	L 4
2732	C12	7630	F18
2733	G 8	7631	H17
2734	D 8	7632	C17
2735	H 6	7633	H16
2737	G 9	7634	C16
2738	D 9	7640	J17
2740	J 2	7640	A17
2741	K 4	7710	G 5
2752	K 4	7710	D 5
2760	L 5	7710	G 4
2761	D 7	7720	E 7
2762	E 8	7720	C 7
2763	E 8	7730	H 7
2765	C 8	7730	B 7
2767	N18	7730	K 7
2780	N 4	7740	C12
2781	N 3	7740	H11
2782	N 3	7740	E12
2783	N 1	7750	N17
2784	N 1	7760	E14
2785	N 2	7760	H13
2786	J 1	7760	B14
2787	K 3	7780	N 5
2788	M18	7781	N 3
3631	H16	7782	L 2
3632	B16	7783	L 3
3633	H17	7784	J 2
3634	C17	7785	I 2
3635	H16	7786	I 3
3636	C17	7787	E 9
3637	H17	7788	N 6
3638	C17	9712	N20
3639	H18	9731	D12
3640	C18	9792	A10
3641	H18	9793	J10
3642	C18	9797	G 9
3643	H18	T161	N 1
3644	C18	T162	G 2
3645	G16	T163	G 2
3646	D16	T164	F 2
3647	G16	T165	F 2
3648	E16	T166	F 2
3649	G17	T167	D 2
3650	D17	T168	D 2
3651	G18	T169	D 2
3652	E18	T170	M 6
3655	J21	T171	E12
3656	B21	T172	B12
3657	J19	T173	K18
3658	B18	T174	H21
3659	I19	T175	L18
3660	A19	T176	H19
3661	K18	T177	E 9
3662	A18	T178	E 3
3663	K17	T179	C 2
3664	A17	T180	L21
3665	K17	T181	K21
3666	A17	T182	G20
3667	G14	T183	E20
3668	A14	T184	M20
3690	H19	T185	M20
3691	D20	T186	M20
3692	D19	T187	N 6
3693	I18	T188	L 3
3694	G18	T189	D 7
3695	I17	T190	A12
3701	F 2	T191	B12
3702	E 2	T192	G19
3703	E 3	T193	I17
3704	D 3	T194	N18
3705	E 6	T195	M 4
3706	C 6		
3707	F 6		
3708	D 6		
3709	H 6		
3710	E 6		
3711	G 8		
3712	D 8		
3713	F 9		
3714	C 9		
3715	F 9		
3716	D10		
3717	H 9		
3718	B 9		
3719	I 8		
3720	B 8		
3721	I 8		
3722	B 9		
3723	I 6		
3724	B 6		
3725	J 6		
3726	A 6		
3727	F10		
3728	D10		
3729	G10		
3730	D10		
3731	G10		

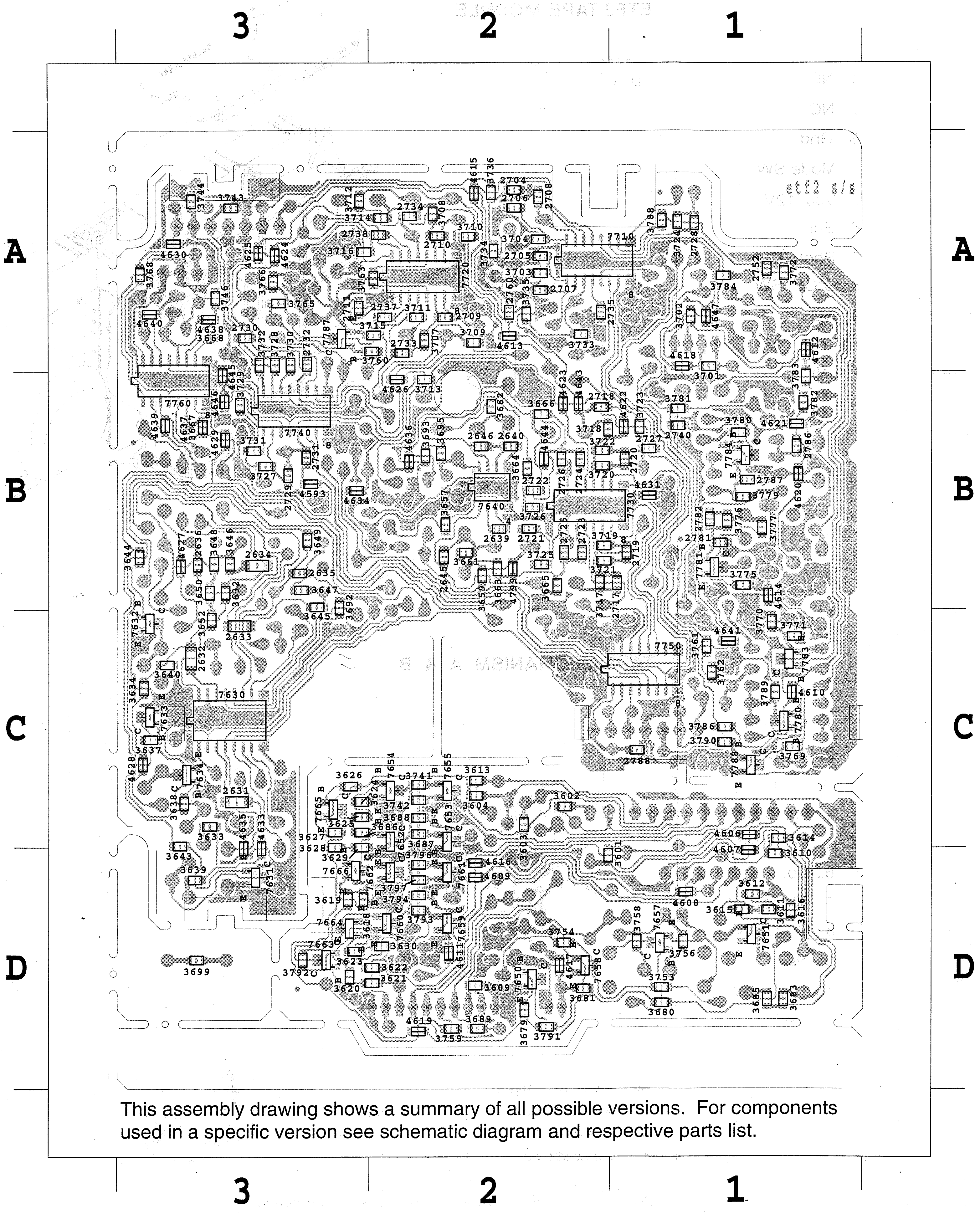
COMPONENT LAYOUT


1
2
3
A
B
C
D
etf2-p4-961021-1
3139 113 33194
etf2-p4-961021-1
3139 113 33194
etf2-p4-961021-1
3139 113 33194
1701
1705
1711
1720
1730
1702
1706
1741
1742
1703
1704
1707

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

8	D	1
9	D	1
1701	A	3
1702	C	1
1703	D	2
1704	D	2
1705	A	3
1706	C	1
1707	D	2
1711	A	1
1720	A	1
1730	A	2
1741	C	1
1742	C	1
2637	C	3
2638	C	3
2641	B	2
2642	B	2
2643	B	2
2644	B	2
2647	B	2
2648	B	2
2691	D	3
2692	D	3
2693	C	3
2694	B	2
2695	B	3
2696	B	3
2701	A	1
2702	A	1
2703	A	2
2712	A	2
2713	B	2
2714	A	3
2715	A	2
2716	A	2
2741	B	1
2761	A	3
2762	A	3
2763	A	3
2765	A	3
2767	C	2
2780	C	1
2783	B	1
2784	B	1
2785	C	1
3605	D	1
3606	D	2
3607	D	2
3608	D	2
3617	D	2
3631	C	3
3635	C	3
3636	C	3
3641	D	3
3642	C	3
3651	C	3
3655	B	3
3656	B	3
3658	B	3
3660	B	2
3682	D	1
3684	D	1
3690	C	1
3691	B	3
3694	B	2
3705	A	2
3706	A	2
3745	B	3
3755	D	1
3757	D	1
3764	A	3
3767	C	1
3773	A	1
3774	C	1
3778	B	1
3785	A	1
3787	C	1
5631	B	3
5632	B	3
5701	B	1
5702	B	1
5703	B	1
6651	D	1
6652	D	1
6760	C	2
6770	C	1
6771	C	1
6772	B	1
6773	B	1
6774	B	1
6775	C	1
6776	C	1
6777	C	1
6790	C	2
6791	D	2
7782	B	1
7785	B	1
7786	A	1
9602	C	3
9603	C	3
9604	C	3
9605	C	3
9606	C	3
9698	D	2
9699	C	2
9700	A	1
9701	B	1
9702	A	1
9703	B	1
9704	C	1
9706	A	2
9707	A	1
9709	A	1
9710	A	2
9711	A	2
9712	C	1
9713	A	2
9714	B	2
9715	B	1
9716	B	2
9717	B	3
9718	B	3
9719	B	3
9720	B	3
9721	A	3
9722	B	2
9723	B	1
9724	B	3
9725	B	3
9726	B	3
9727	B	3
9728	B	2
9729	B	3
9730	B	3
9731	A	3
9732	A	3
9733	B	3
9779	D	2
9780	C	2
9783	D	1
9784	D	2
9785	D	2
9786	D	2
9787	D	2
9790	B	3
9791	B	2
9792	B	2
9793	B	2
9797	B	1
9799	B	2

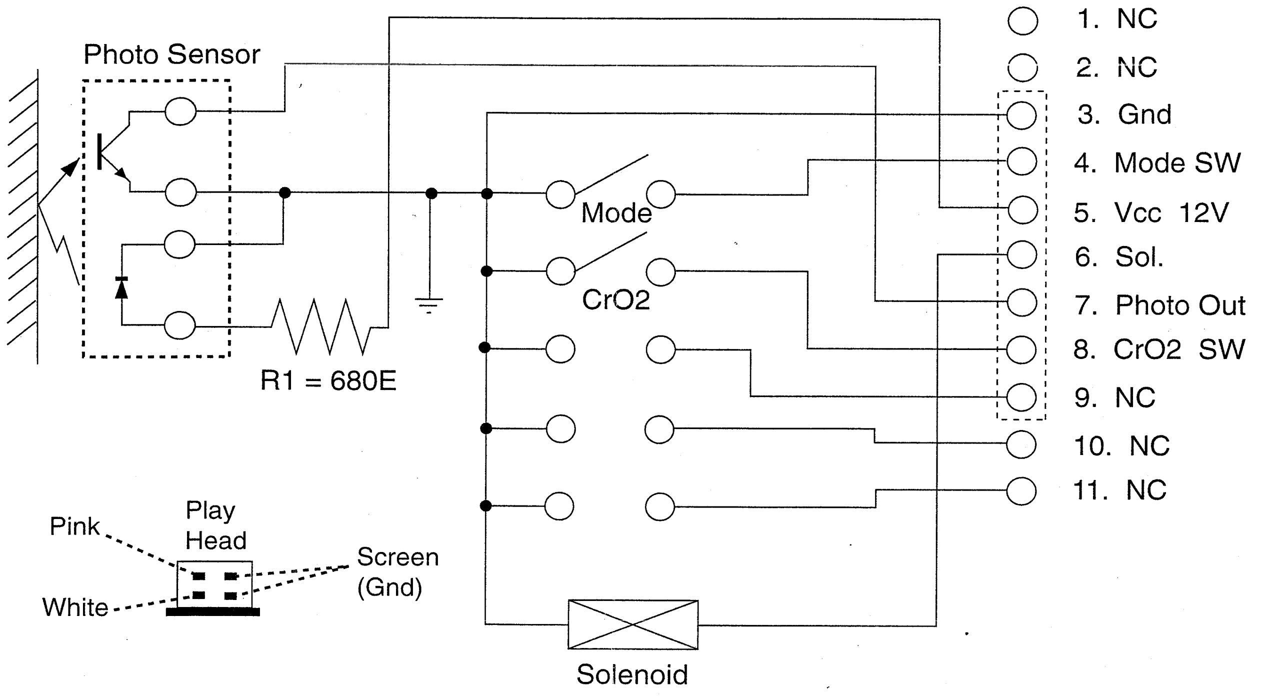
CHIP LAYOUT



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

2631	C	3
2632	C	3
2633	C	3
2634	B	3
2635	B	3
2636	B	3
2639	B	2
2640	B	2
2645	B	2
2646	B	2
2704	A	2
2705	A	2
2706	A	2
2707	A	2
2708	A	2
2709	A	2
2710	A	2
2711	A	3
2717	B	1
2718	B	2
2719	B	1
2720	B	1
2721	B	2
2722	B	2
2723	B	2
2724	B	2
2725	B	2
2726	B	2
2727	B	1
2728	A	1
2729	B	3
2730	A	3
2731	B	3
2732	A	3
2733	A	2
2734	A	2
2735	A	2
2737	A	2
2738	A	2
2740	B	1
2752	A	1
2760	A	2
2781	B	1
2782	B	1
2786	B	1
2787	B	1
2788	C	1
3601	D	2
3602	C	2
3603	C	2
3604	C	2
3609	D	2
3610	D	1
3611	D	1
3612	D	1
3613	C	2
3614	C	1
3615	D	1
3616	D	1
3618	D	3
3619	D	3
3620	D	3
3621	D	2
3622	D	2
3623	D	3
3624	C	3
3625	C	3
3626	C	3
3627	C	3
3628	D	3
3629	D	3
3630	D	2
3632	B	3
3633	C	3
3634	C	3
3637	C	3
3638	C	3
3639	D	3
3640	C	3
3643	C	3
3644	B	3
3645	B	3
3646	B	3
3647	B	3
3648	B	3
3649	B	3
3650	B	3
3652	C	3
3657	B	2
3659	B	2
3661	B	2
3662	B	2
3663	B	2
3664	B	2
3665	B	2
3666	B	2
3667	B	3
3668	A	3
3679	D	2
3680	D	1
3681	D	2
3683	D	1
3685	D	1
3686	C	3
3687	C	2
3688	C	2
3689	D	2
3692	B	3
3693	B	2
3695	B	2
3699	D	3
3701	A	1
3702	A	1
3703	A	2
3704	A	2
3707	A	2
3708	A	2
3709	A	2
3710	A	2
3711	A	2
3712	A	3
3713	B	2
3714	A	2
3715	A	2
3716	A	3
3717	B	2
3718	B	2
3719	B	2
3720	B	2
3721	B	2
3722	B	2
3723	B	1
3724	A	1
3725	B	2
3726	B	2
3727	B	3
3728	A	3
3729	B	3
3730	A	3
3731	B	3
3732	A	3
3733	A	2
3734	A	2
3735	A	2
3736	A	2
3741	C	2
3742	C	2
3743	A	3
3744	A	3
3746	A	3
3753	D	1
3754	D	2
3756	D	1
3758	D	1
3759	D	2
3760	A	2
3761	C	1
3762	C	1
3763	A	2
3765	A	3
3766	A	3
3768	A	3
3769	C	1
3770	C	1
3771	C	1
3772	A	1
3775	B	1
3776	B	1
3777	B	1
3779	B	1
3780	B	1
3781	B	1
3782	B	1
3783	B	1
3784	A	1
3786	C	1
3788	A	1
3789	C	1
3790	C	1
3791	D	2
3792	D	3
3793	D	2
3794	D	2
3796	D	2
3797	D	2
4593	B	3
4606	C	1
4607	D	1
4608	D	1
4609	D	2
4610	C	1
4611	D	2
4612	A	1
4613	A	2
4614	B	1
4615	A	2
4616	D	2
4617	D	2
4618	A	1
4619	D	2
4620	B	1
4621	B	1
4622	B	1
4623	B	2
4624	A	3
4625	A	3
4626	B	2
4627	B	3
4628	C	3
4629	B	3
4630	A	3
4631	B	1
4633	D	3
4634	B	3
4635	D	3
4636	B	2
4637	B	3
4638	A	3
4639	B	3
4640	A	3
4641	C	1
4643	B	2
4644	B	2
4645	B	3
4646	B	3
4647	A	1
4799	B	2
7630	C	3
7631	D	3
7632	C	3
7633	C	3
7634	C	3
7640	B	2
7650	D	2
7651	D	1
7652	C	2
7653	C	2
7654	C	2
7655	C	2
7657	D	1
7658	D	2
7659	D	2
7660	D	2
7661	D	2
7662	D	2
7663	D	3
7664	D	3
7665	C	3
7666	D	3
7710	A	2
7720	A	2
7730	B	2
7740	B	3
7750	C	1
7760	B	3
7780	C	1
7781	B	1
7783	C	1
7784	B	1
7787	A	3
7788	C	1

TAPE MECHANISM A ELECTRONICS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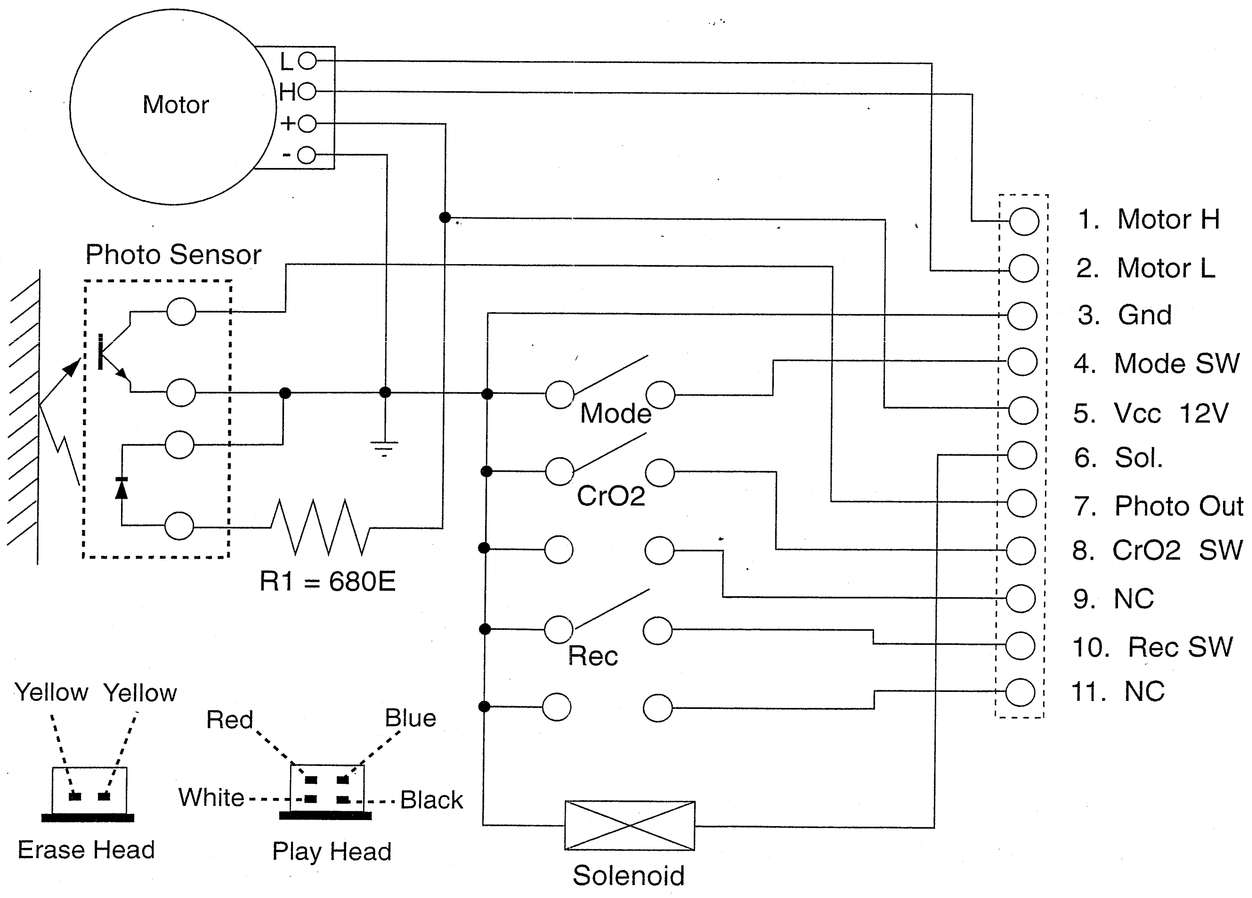
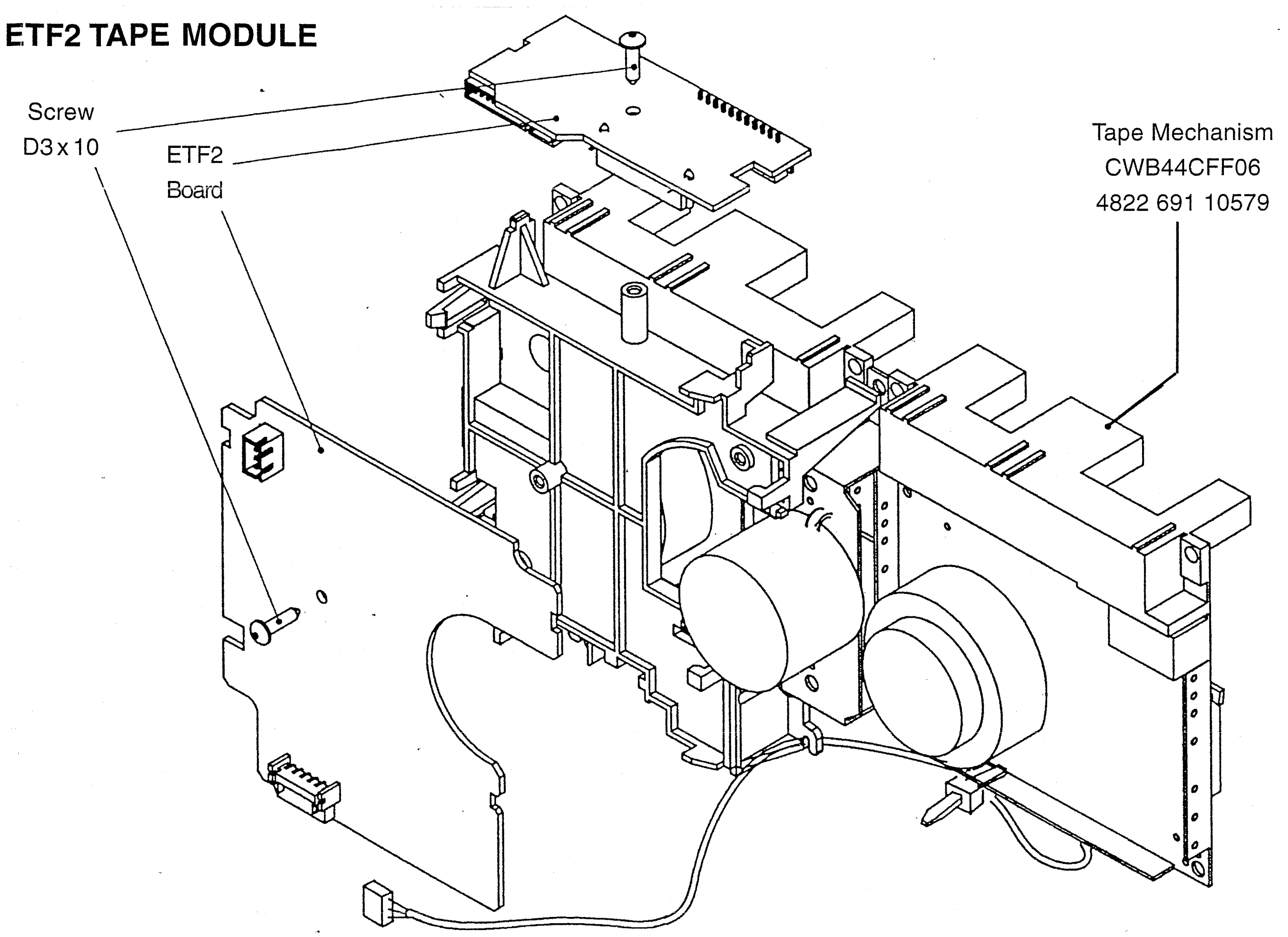
R1 = 680E
Mode
CrO2
1. NC
2. NC
3. Gnd
4. Mode SW
5. Vcc 12V
6. Sol.
7. Photo Out
8. CrO2 SW
9. NC
10. NC
11. NC
Pink
Play Head
White
Screen (Gnd)
Solenoid

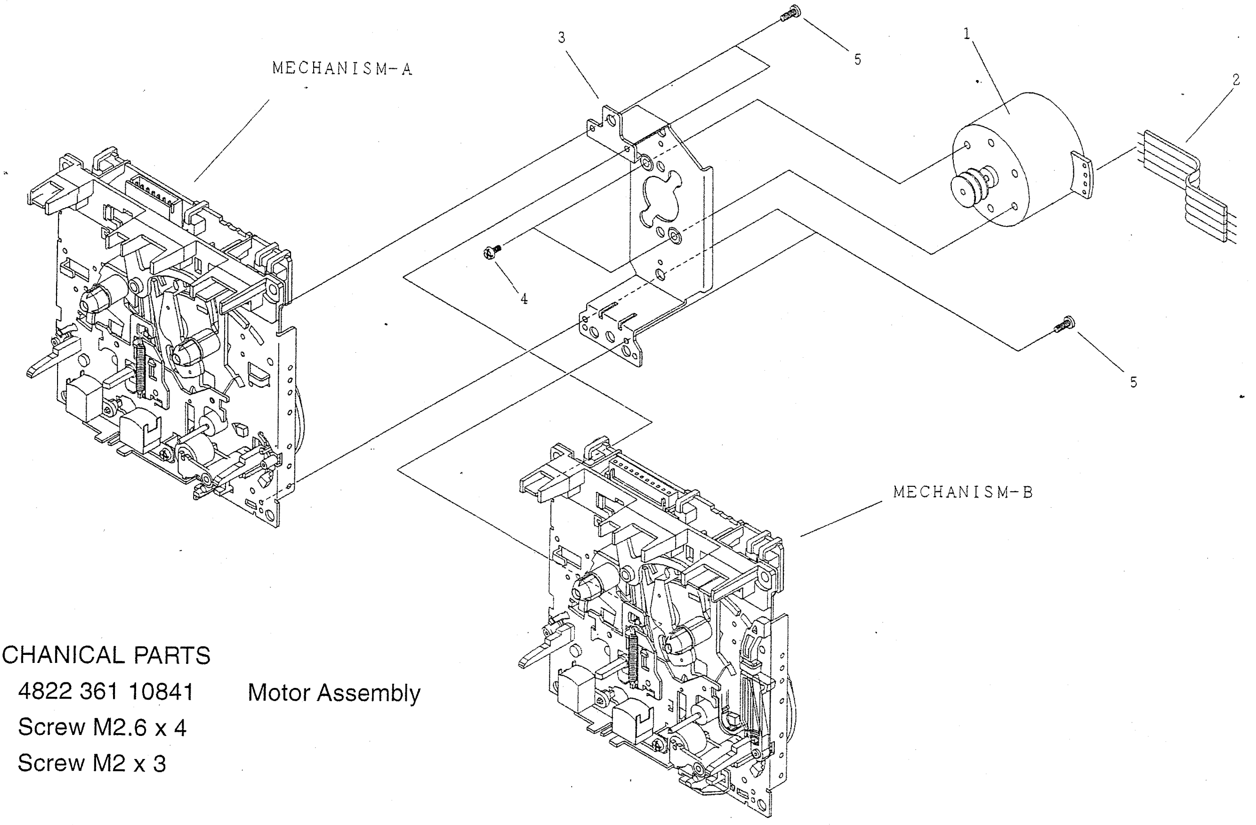
TAPE MECHANISM B ELECTRONICS


Motor
L
H
+
-
Photo Sensor
R1 = 680E
Mode
CrO2
Rec
1. Motor H
2. Motor L
3. Gnd
4. Mode SW
5. Vcc 12V
6. Sol.
7. Photo Out
8. CrO2 SW
9. NC
10. Rec SW
11. NC
Yellow Yellow
Erase Head
Red
Blue
White
Black
Play Head
Solenoid

ETF2 TAPE MODULE


Screw
D3 x 10
ETF2
Board
Tape Mechanism
CWB44CFF06
4822 691 10579

TAPE MECHANISM A & B

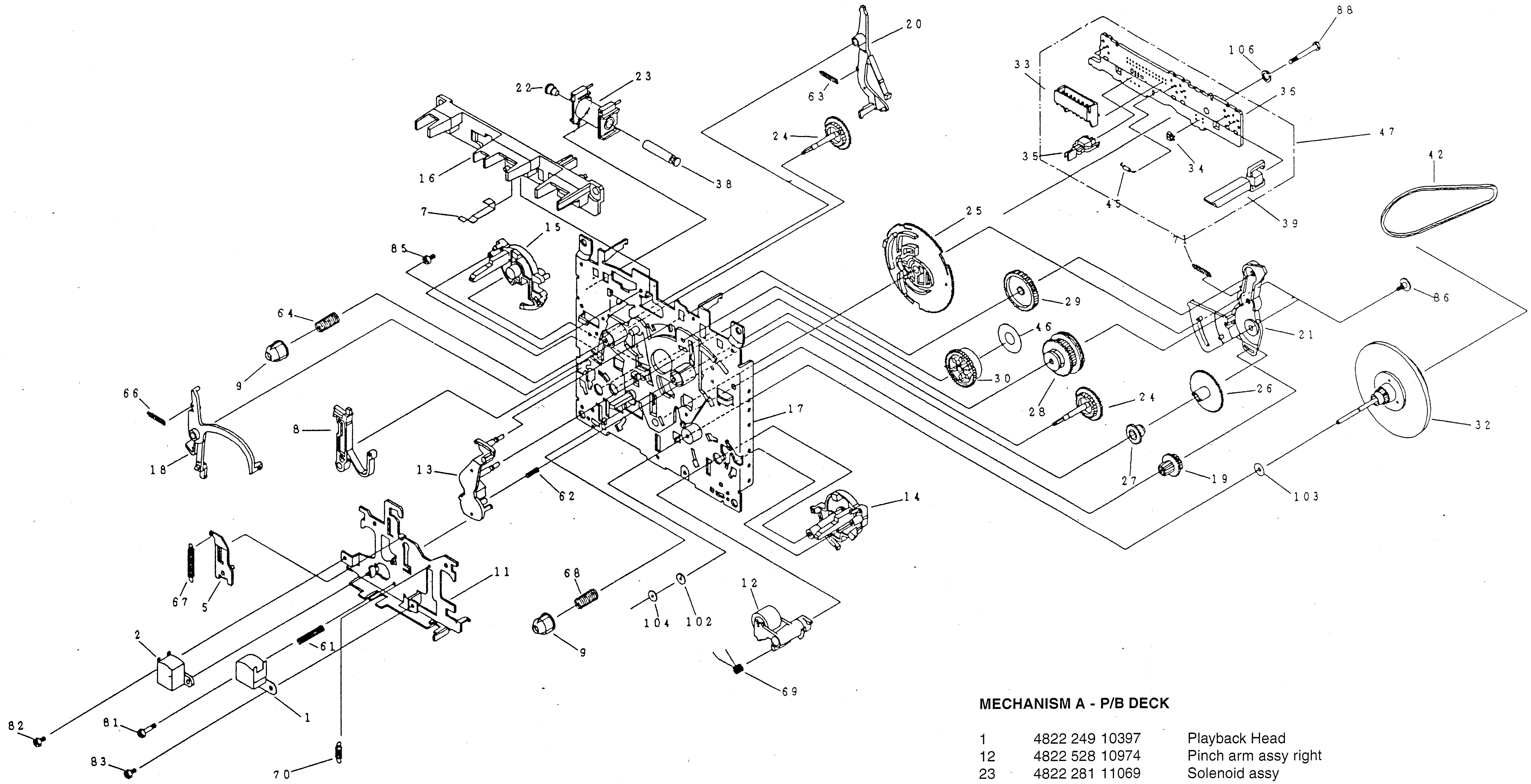

MECHANISM-A
MECHANISM-B
1
2
3
4
5
5

MECHANICAL PARTS

1	4822 361 10841	Motor Assembly
4	Screw M2.6 x 4	
5	Screw M2 x 3	

NOTE: Only the parts mentioned in this list are normal service spare parts.

PLAYBACK MECHANISM A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88
22
23
106
33
63
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34
16
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7
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15
85
71
86
29
64
46
21
9
66
30
24
26
32
17
8
28
18
13
27
19
14
62
103
11
67
5
68
12
104
102
2
61
9
69
1
82
81
83
70

MECHANISM A - P/B DECK

1	4822 249 10397	Playback Head
12	4822 528 10974	Pinch arm assy right
23	4822 281 11069	Solenoid assy
35	4822 277 11531	Mode Switch
39	4822 276 13704	Leaf Switch
42	4822 358 10168	Belt

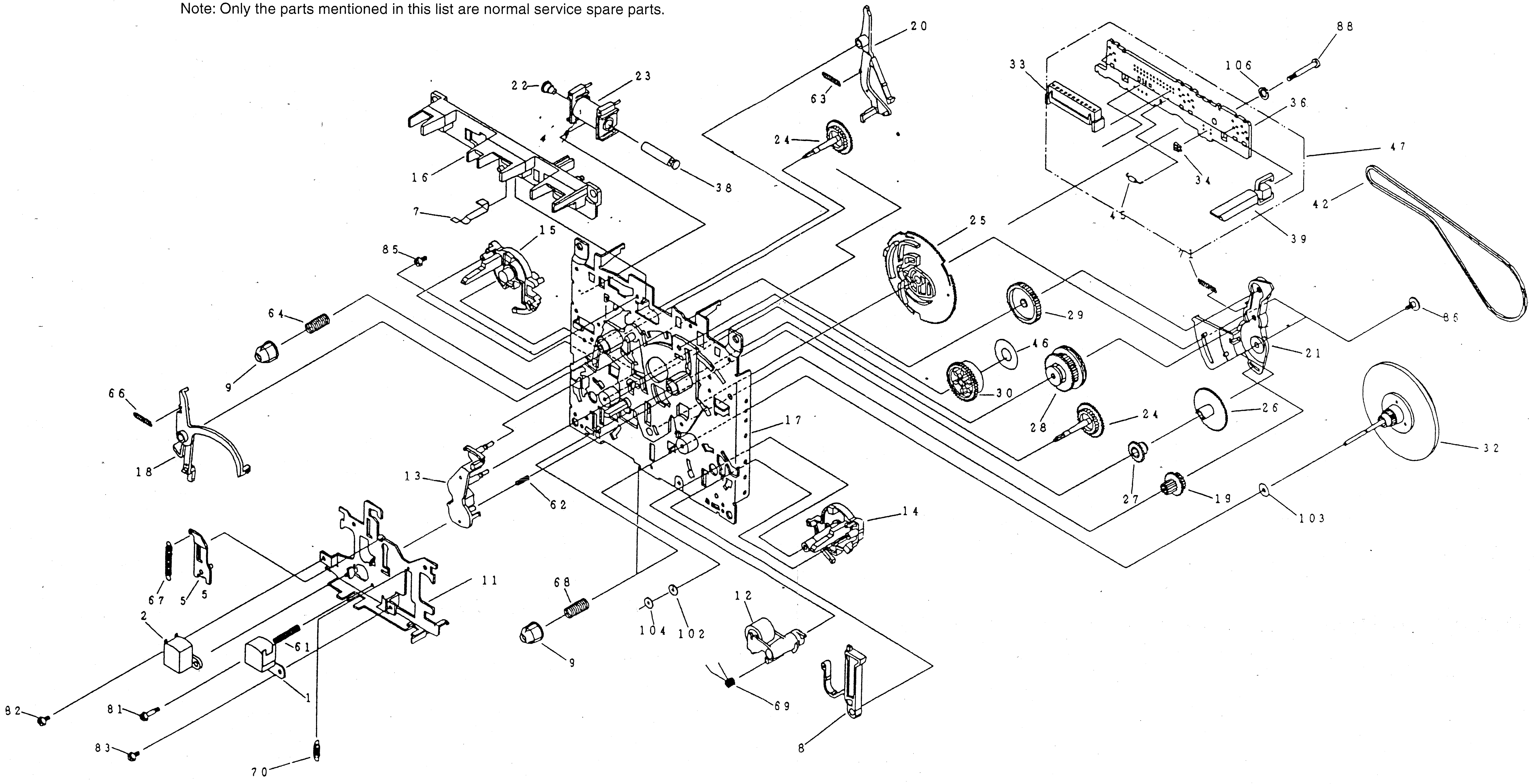
Note: Only the parts mentioned in this list are normal service spare parts.

REC/PLAYBACK MECHANISM B

MECHANISM B REC/PB DECK

1	4822 249 10526	REC/PB Head
10	4822 528 10975	Pinch arm assy left
12	4822 528 10974	Pinch arm assy right
23	4822 281 11069	Solenoid assy
35	4822 277 11531	Mode Switch
39	4822 276 13704	Leaf Switch
42	4822 358 10169	Belt

Note: Only the parts mentioned in this list are normal service spare parts.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29
64
86
46
21
9
30
66
28
26
24
17
32
18
13
27
62
19
14
103
11
68
12
67
5
5
2
104
102
61
9
1
69
82
81
83
8
70

CASSETTE BOARD PARTLIST

CAPACITOR

2701	4822 122 33195	100pF 10% 50V (FW363)
2701	4822 126 12787	220PF 10% 50V
2702	4822 126 12787	330PF 10% 50V
2702	4822 122 33195	100pF 10% 50V
2703	4822 122 33195	100pF 10% 50V
2704	5322 122 31863	330pF 5% 50V
2705	5322 122 31863	330pF 5% 50V
2706	5322 122 32531	100pF 5% 50V
2707	5322 122 34099	470pF 10% 63V
2708	5322 122 34099	470pF 10% 63V
2709	5322 122 31863	330pF 5% 50V
2710	5322 122 31863	330pF 5% 50V
2711	5322 122 32531	100pF 5% 50V
2712	4822 122 33195	100pF 10% 50V
2713	4822 124 41579	10µF 20% 50V
2714	4822 124 41579	10µF 20% 50V
2715	4822 124 41584	100µF 20% 10V (For -/22 & -/25)
2715	4822 124 40849	330µF 20% 16V
2716	4822 124 41584	100µF 20% 10V (For -/22 & -/25)
2716	4822 124 40849	330µF 20% 16V
2717	4822 122 33175	2.2nF 20% 50V
2718	4822 122 33175	2.2nF 20% 50V
2719	4822 122 33893	18nF 10% 63V
2720	4822 122 33893	18nF 10% 63V
2721	4822 122 33177	10nF 20% 50V
2722	4822 122 33177	10nF 20% 50V
2723	5322 122 33538	150pF 5% 63V (FW373)
2723	4822 122 33342	33nF 10% 63V (FW363)
2724	5322 122 33538	150pF 5% 63V (FW373)
2724	4822 122 33342	33nF 10% 63V (FW363)
2725	5322 126 10794	220pF 5% 63V
2726	5322 126 10794	220pF 5%63V
2727	4822 122 32535	680pF 10% 63V
2728	4822 122 32535	680pF 10% 63V
2729	4822 122 32541	27nF 10% 63V
2730	4822 122 32541	27nF 10% 63V
2733	5322 122 34099	470pF 5% 50V
2734	5322 122 31863	330pF 5% 50V
2735	4822 126 10002	100nF 20% 25V
2737	5322 122 32654	22nF 10% 63V

CAPACITORS

2738	5322 122 32654	22nF 10% 63V
2740	5322 122 32654	22nF 10% 63V
2741	4822 126 11714	4.7nF 20%
2752	5322 122 32654	22nF 10% 63V
2760	4822 126 10002	100nF 20% 25V
2761	4822 124 22263	220µF 20% 25V
2762	4822 124 41576	2.2µF 20% 50V
2763	4822 124 41584	100µF 20% 10V
2765	4822 124 40433	47µF 20% 25V
2767	4822 124 41579	10µF 20% 50V
2780	4822 124 41596	22µF 20% 50V
2781	4822 122 33177	10nF 20% 50V
2782	5322 126 10223	4.7nF 10% 63V
2783	5322 121 42386	100nF 5% 63V
2784	4822 121 41856	22nF 5% 250V
2785	4822 124 40242	1µF 20% 63V
2786	5322 122 32531	100pF 5% 50V
2787	4822 122 33342	33nF 10% 63V
2788	5322 122 34123	1nF 10% 50V

RESISTORS

3601	4822 117 11449	2k2 1% 0.1W
3602	4822 117 11449	2k2 1% 0.1W
3604	4822 117 11449	2k2 1% 0.1W
3605	4822 116 52239	120k 5% 0.5W
3606	4822 116 52291	56k 5% 0.5W
3608	4822 116 52239	120k 5% 0.5W
3609	4822 051 20273	27k 5% 0.1W
3610	4822 117 11449	2k2 1% 0.1W
3611	4822 117 11449	2k2 1% 0.1W
3613	4822 117 11449	2k2 1% 0.1W
3614	4822 051 20124	120k 5% 0.1W
3615	4822 051 20563	56k 5% 0.1W
3617	4822 116 52291	56k 5% 0.5W
3618	4822 051 20472	4k7 5% 0.1W
3619	4822 051 20103	10k 5% 0.1W
3620	4822 051 20103	10k 5% 0.1W
3621	4822 051 20473	47k 5% 0.1W
3622	4822 051 20473	47k 5% 0.1W
3623	4822 051 20103	10k 5% 0.1W
3624	4822 051 20472	4k7 5% 0.1W

CASSETTE BOARD PARTLIST

RESISTORS

3625	4822 051 20103	10k 5% 0.1W
3626	4822 051 20103	10k 5% 0.1W
3627	4822 051 20473	47k 5% 0.1W
3628	4822 051 20473	47k 5% 0.1W
3629	4822 051 20103	10k 5% 0.1W
3630	4822 051 20273	27k 5% 0.1W
3679	4822 051 20473	47k 5% 0.1W
3680	4822 051 20472	4k7 5% 0.1W
3681	4822 051 20472	4k7 5% 0.1W
3683	4822 051 20103	10k 5% 0.1W
3684	4822 100 11319	4k7 30%lin 0.1W
3685	4822 051 20822	8k2 5% 0.1W
3686	4822 051 20473	47k 5% 0.1W
3687	4822 051 20471	470Ω 2% 0.25W
3688	4822 051 20104	100k 5% 0.1W
3689	4822 051 20273	27k 5% 0.1W
3699	4822 051 20332	3k3 5% 0.1W
3701	4822 051 20221	220Ω 5% 0.1W
3702	4822 051 20221	220Ω 5% 0.1W
3703	4822 051 20221	220Ω 5% 0.1W
3704	4822 051 20221	220Ω 5% 0.1W
3705	4822 116 83872	220Ω 5% 0.5W
3706	4822 116 83872	220Ω 5% 0.5W
3707	4822 051 20101	100Ω 5% 0.1W
3708	4822 051 20101	100Ω 5% 0.1W
3709	4822 051 20688	6Ω8 5% 0.1W
3710	4822 051 20688	6Ω8 5% 0.1W
3711	4822 051 20184	180k 5% 0.1W
3712	4822 051 20184	180k 5% 0.1W
3713	4822 117 11449	2k2 1% 0.1W
3714	4822 117 11449	2k2 1% 0.1W
3715	4822 051 20182	1k8 5% 0.1W
3716	4822 051 20182	1k8 5% 0.1W
3717	4822 051 20392	3k9 5% 0.1W
3718	4822 051 20392	3k9 5% 0.1W
3719	4822 051 20822	8k2 5% 0.1W
3720	4822 051 20822	8k2 5% 0.1W
3721	4822 051 20562	5k6 5% 0.1W
3722	4822 051 20562	5k6 5% 0.1W
3723	4822 117 11383	12k 1% 0.1W

RESISTORS

3724	4822 117 11383	12k 1% 0.1W
3725	4822 051 10102	1k 2% 0.25W
3726	4822 051 10102	1k 2% 0.25W
3727	4822 051 20562	5k6 5% 0.1W
3728	4822 051 20562	5k6 5% 0.1W
3729	4822 051 20272	2k7 5% 0.1W
3730	4822 051 20272	2k7 5% 0.1W
3731	4822 051 20682	6k8 5% 0.1W
3732	4822 051 20682	6k8 5% 0.1W
3765	4822 051 20393	39k 5% 0.1W
3766	4822 051 20475	4M7 5% 0.1W
3767	4822 116 52219	330Ω 5% 0.5W
3768	4822 051 20103	10k 5% 0.1W
3769	4822 051 20103	10k 5% 0.1W (For -/22 & -/25)
3769	4822 051 20822	8k2 5% 0.1W
3770	4822 117 11139	1k5 1% 0.1W
3771	4822 051 20122	1k2 5% 0.1W
3772	4822 051 20822	8k2 5% 0.1W
3773	5322 100 11542	4k7 30%lin 0.1W
3774	4822 116 52303	8k2 5% 0.5W
3775	4822 051 20159	15Ω 5% 0.1W
3776	4822 051 20682	6k8 5% 0.1W
3777	4822 117 10353	150Ω 1% 0.1W
3778	4822 052 10109	10Ω 5% 0.33W
3779	4822 051 20334	330k 5% 0.1W
3780	4822 051 20105	1M 5% 0.1W
3781	4822 051 20475	4M7 5% 0.1W
3782	4822 051 20472	4k7 5% 0.1W
3783	4822 051 20472	4k7 5% 0.1W
3784	4822 051 20153	15k 5% 0.1W
3785	5322 100 11539	100k 30%lin 0.1W
3786	4822 117 11449	2k2 1% 0.1W
3787	4822 116 52235	1M 5% 0.5W
3788	4822 051 20105	1M 5% 0.1W
3789	4822 051 20223	22k 5% 0.1W
3790	4822 051 20473	47k 5% 0.1W
3796	4822 051 10102	1k 2% 0.25W
3797	4822 051 20104	100k 5% 0.1W

CASSETTE BOARD PARTLIST

JUMPER

4606	4822 051 20008	0Ω Jumper
4607	4822 051 20008	0Ω Jumper
4608	4822 051 20008	0Ω Jumper
4609	4822 051 20008	0Ω Jumper
4610	4822 051 20008	0Ω Jumper
4611	4822 051 20008	0Ω Jumper
4612	4822 051 20008	0Ω Jumper
4614	4822 051 20008	0Ω Jumper
4615	4822 051 20008	0Ω Jumper
4616	4822 051 20008	0Ω Jumper
4617	4822 051 20008	0Ω Jumper
4618	4822 051 20008	0Ω Jumper
4619	4822 051 20008	0Ω Jumper
4620	4822 051 20008	0Ω Jumper
4621	4822 051 20008	0Ω Jumper
4622	4822 051 20008	0Ω Jumper
4623	4822 051 20008	0Ω Jumper
4624	4822 051 20008	0Ω Jumper
4625	4822 051 20008	0Ω Jumper
4626	4822 051 20008	0Ω Jumper
4630	4822 051 20008	0Ω Jumper
4631	4822 051 20008	0Ω Jumper
4641	4822 051 20008	0Ω Jumper
4647	4822 051 20008	0Ω Jumper

COIL

5701	4822 156 20946	Coil Osc 100kHz
5702	4822 156 21721	Coil 2.2µH 10%
5703	4822 156 21721	Coil 2.2µH 10%

DIODE

6651	4822 130 30621	1N4148
6760	4822 130 34233	BZX79-C5V1
6770	4822 130 30621	1N4148
6771	4822 130 30621	1N4148
6772	4822 130 30621	1N4148
6773	4822 130 30621	1N4148
6774	4822 130 30621	1N4148
6775	4822 130 30621	1N4148
6776	4822 130 30621	1N4148
6777	4822 130 34382	BZX79-C8V2
6790	5322 130 30684	1N4002
6791	5322 130 30684	1N4002

TRANSISTOR

7631	5322 130 42136	BC848C (For -/22 & -/25)
7632	5322 130 42136	BC848C (For -/22 & -/25)
7633	5322 130 42136	BC848C (For -/22 & -/25)
7634	5322 130 42136	BC848C (For -/22 & -/25)
7650	5322 130 42136	BC848C
7651	4822 130 42513	BC858C
7652	5322 130 42136	BC848C
7653	5322 130 60123	BC807-40
7654	5322 130 42136	BC848C
7655	5322 130 60123	BC807-40

TRANSISTORS

7661	5322 130 60123	BC807-40
7662	5322 130 42136	BC848C
7663	4822 130 42513	BC858C
7665	4822 130 42513	BC858C
7666	5322 130 42136	BC848C
7780	5322 130 42136	BC848C
7781	5322 130 42136	BC848C
7782	5322 130 60068	BC558C
7783	5322 130 42136	BC848C
7784	4822 130 60373	BC856B
7785	4822 130 63494	J111
7786	4822 130 63494	J111
7787	5322 130 42136	BC848C
7788	5322 130 42136	BC848C

INTERGRATED CIRCUITS

7630	4822 209 90406	CXA1101M (For -/22 & -/25)
7640	4822 209 83357	NJM4560M (For -/22 & -/25)
7710	4822 209 32919	HEF4952BT
7720	4822 209 32918	AN7318S
7730	4822 209 32919	HEF4952BT
7740	4822 209 32919	HEF4952BT
7750	5322 209 11306	HEF4094BT
7760	4822 209 32919	HEF4952BT (For -/22 & -/25)

CDC3 MODULE BOARD

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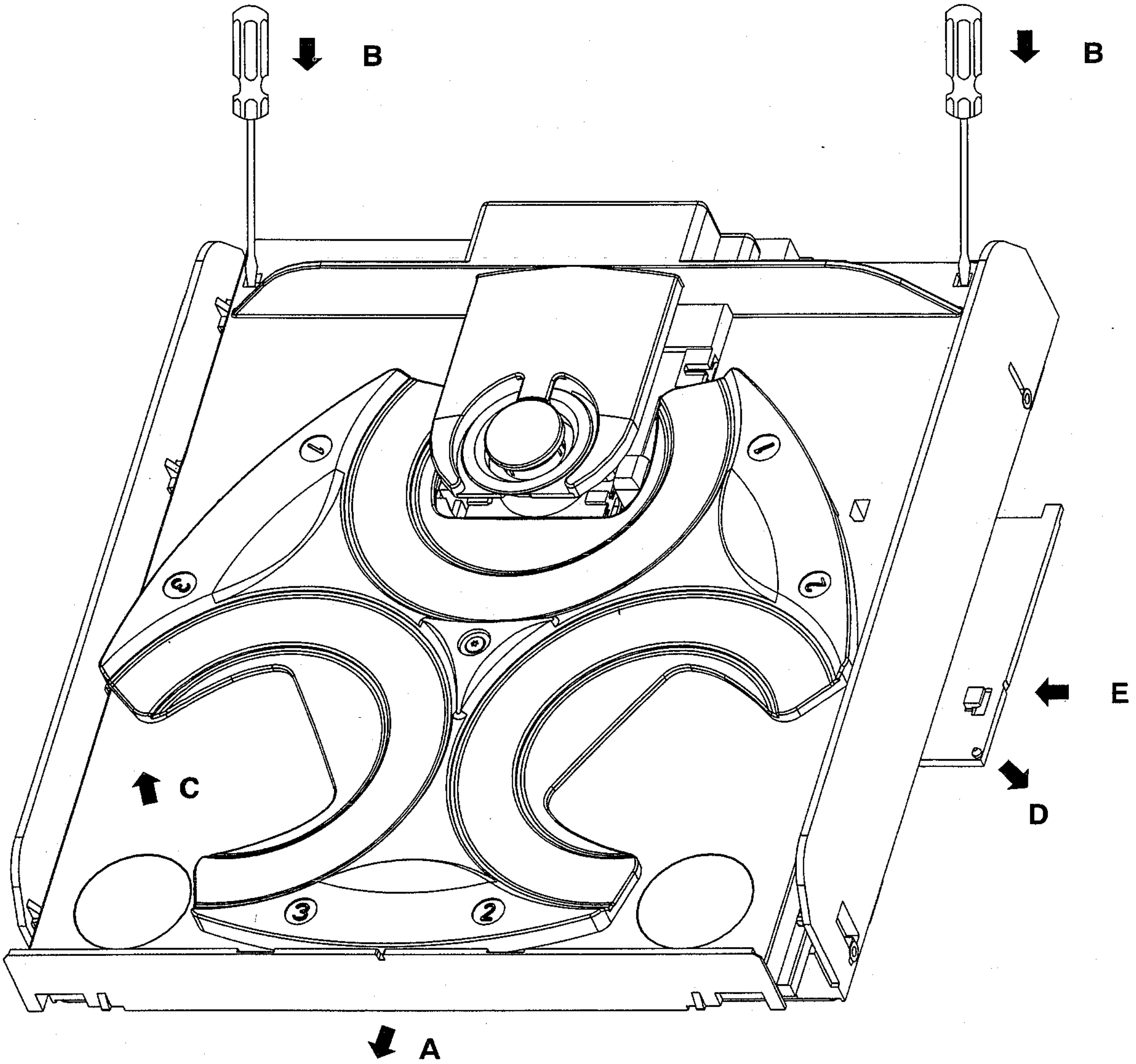
DEMOUNTING HINTS



DEMOUNTING OF DRAWER

⇒ **A** Pull drawer outwards
⇒ **B** Unlock drawer with srcrewdriver
⇒ **C** Lift drawer to demount from chassis

DEMOUNTING OF FLEX PLATE

⇒ **D** Lift plate to unlock pin from bottom plate
⇒ **E** Move plate inwards to demount from bottom plate

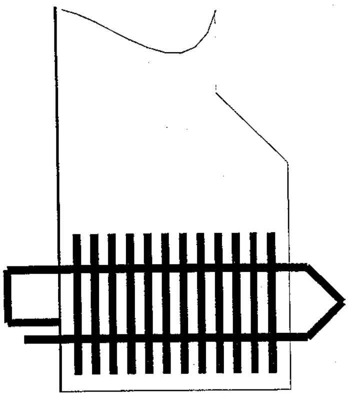
SERVICING HINTS

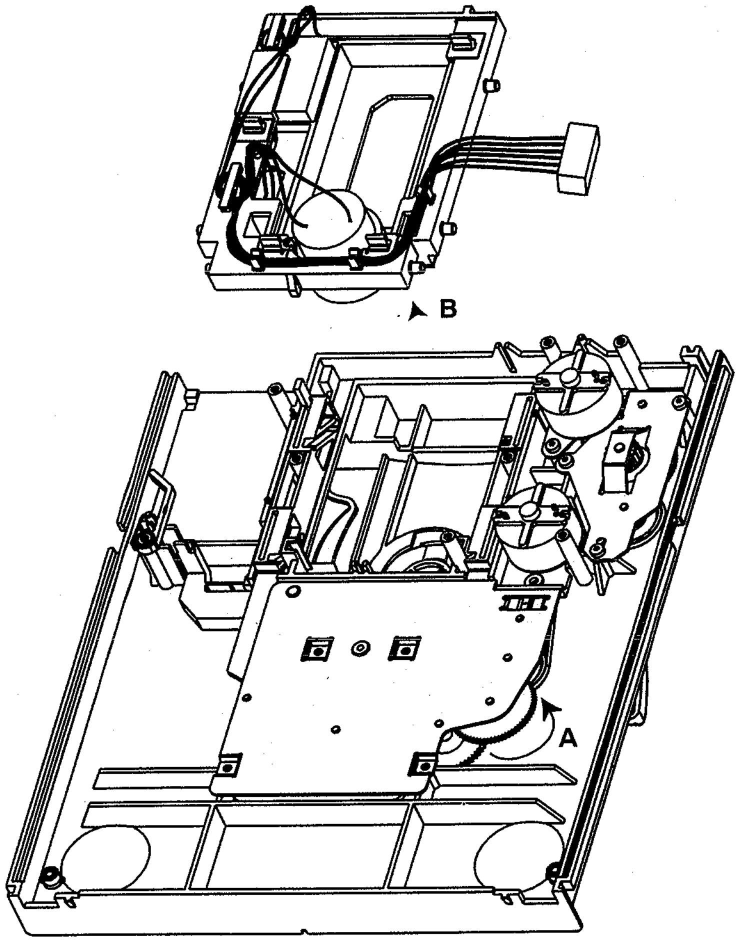
REPLACEMENT OF CDM-12.1

See also exploded view of changer mechanism.

1. Demount flex plate (140).
2. Demount printboard: remove 6 screws and desolder lips of tray motor and carrousel motor.
3. Disconnect flexfoil and JST connector of CDM from PCB. Put paperclip on flexfoil to protect CDM against laser damage.
4. Remove 2 screws 107 and 108 and demount CDM lockings 105 and 106.
5. Turn gearwheel 42 of disc-change-mechanism by finger to move CDM-support in upper position(position of carrousel between 2 discs during changing). **A**
6. Demount CDM-support 95. **B**
7. Replace CDM 100. The wire tree of JST connector has to be desoldered and resoldered on the new CDM.

CDM flex foil





MOUNTING OF CARROUSEL

1. Turn gearwheel 42 of disc change mechanism by finger until CDM is in play position.
2. Mount carrousel 115 so that disc is positioned right on the turntable. Carrousel positionnumber doesn't matter.

CD SERVO SERVICE HINTS

CHARGED CAPACITORS ON THE SERVO BOARD MAY DAMAGE THE CDM-ELECTRONICS WHEN CONNECTION IS MADE TO A NEW CDM MECHANISM. THAT'S WHY, BESIDES THE SAFETY MEASURES LIKE
- SWITCH OFF POWER SUPPLY
- ESD PROTECTION
ADDITIONAL ACTIONS MUST BE TAKEN BY THE REPAIR TECHNICIAN.

The following steps have to be done when replacing the CDM mechanism:
1. Disconnect old CDM flexfoil from printed board
2. Connect paper-clip to CDM flexfoil to short-circuit flexfoil (fig. 1)
3. Short-circuit printed board with brass-sheet (4822 321 11197) plugged into the flexfoil connector (fig. 2)
4. Remove old CDM mechanism
5. Position new CDM mechanism in its studs
6. Remove short-circuit from printed board connector
7. Remove short-circuit from flexfoil of new CDM
8. Connect new flexfoil to print connector (fig. 3)

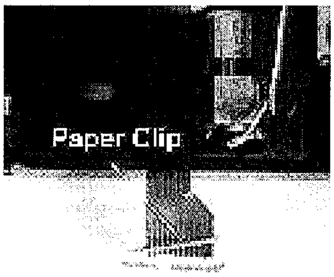


Figure 1

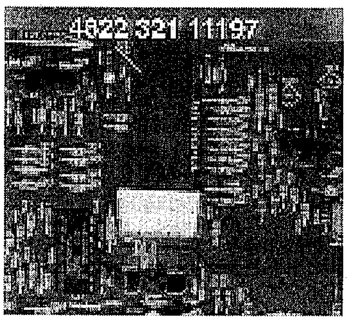


Figure 2

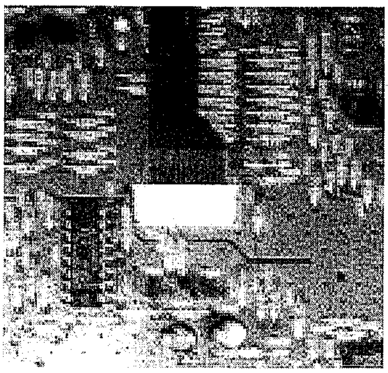
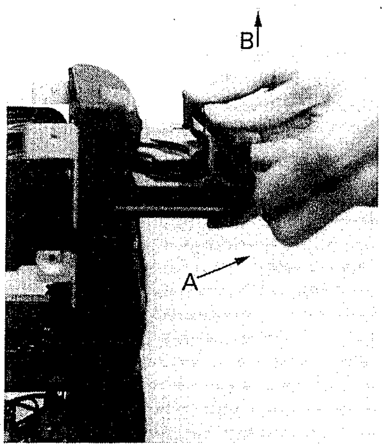
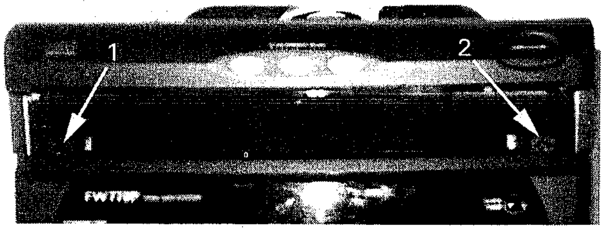


Figure 3

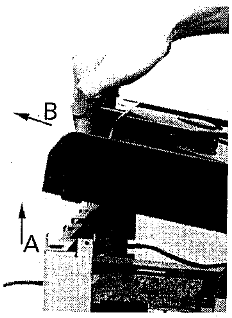
Dismantling Hints for CDC Module



1) Remove the CDC Cover as indicated

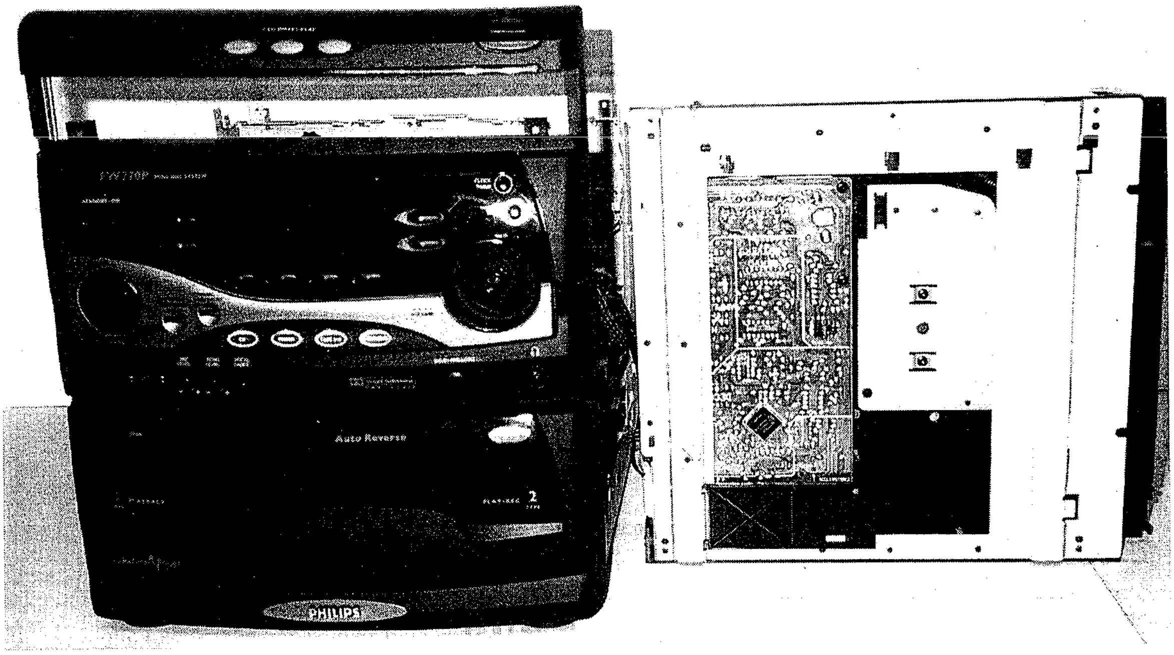


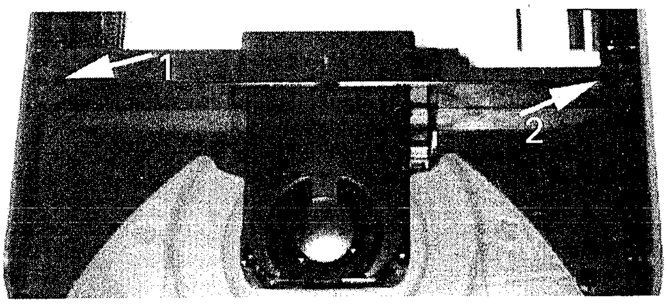
2) Remove the 2 hidden screws



3) Remove the bacj screws, lift-up the Module and pull it out

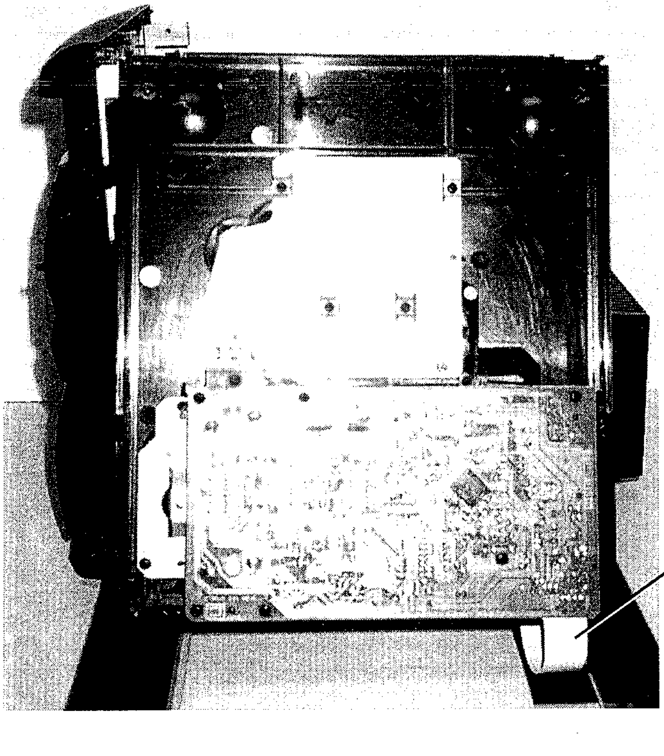
Service Position A


Auto Reverse
PHILIPS



1) Press down the tray catches at position 1 & 2 before pulling the tray out

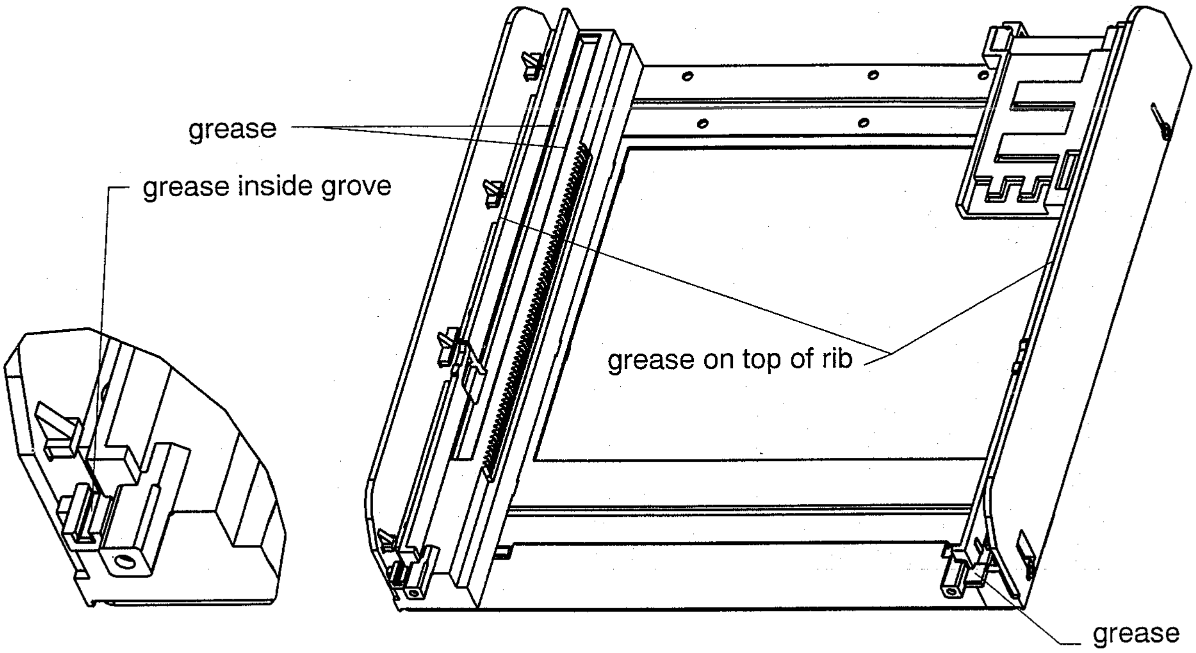
Service Position B



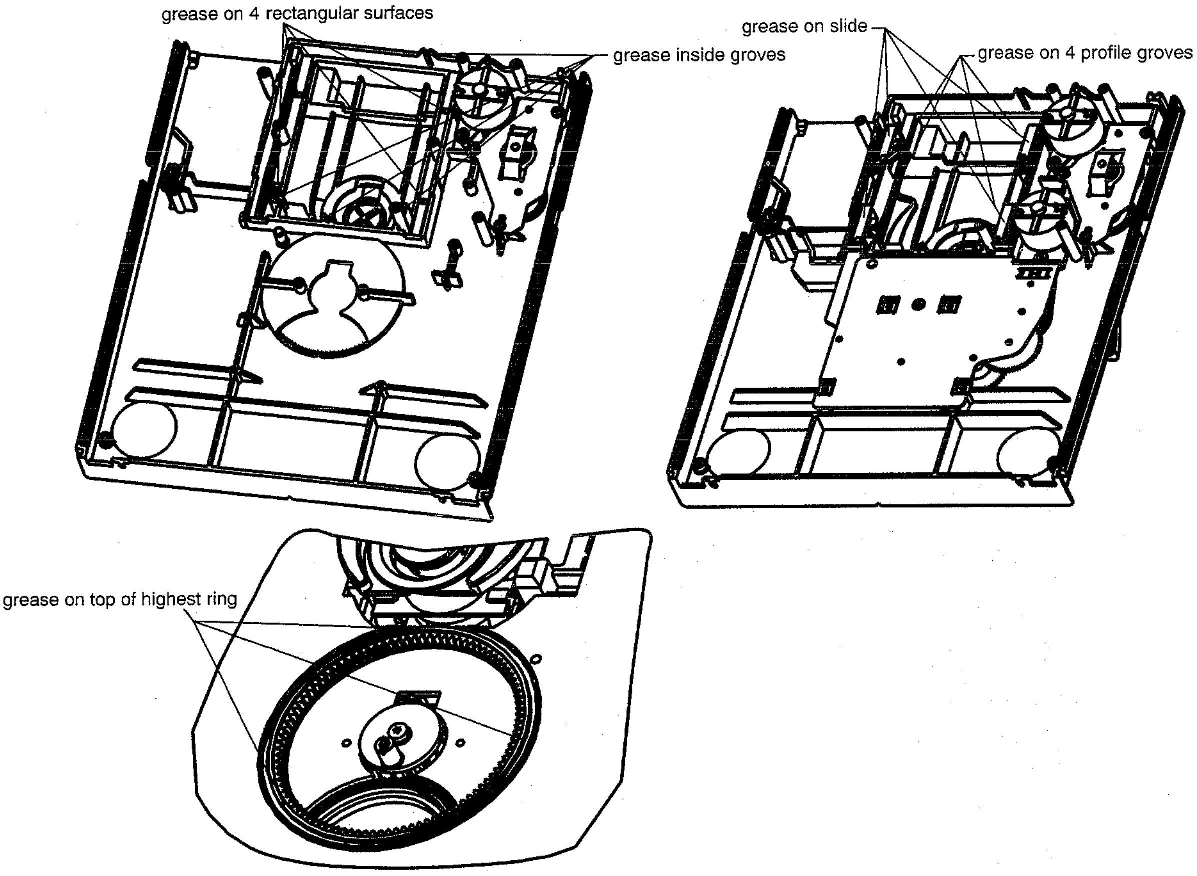
Be careful not to damage this flex cable

LUBRICATING INSTRUCTIONS

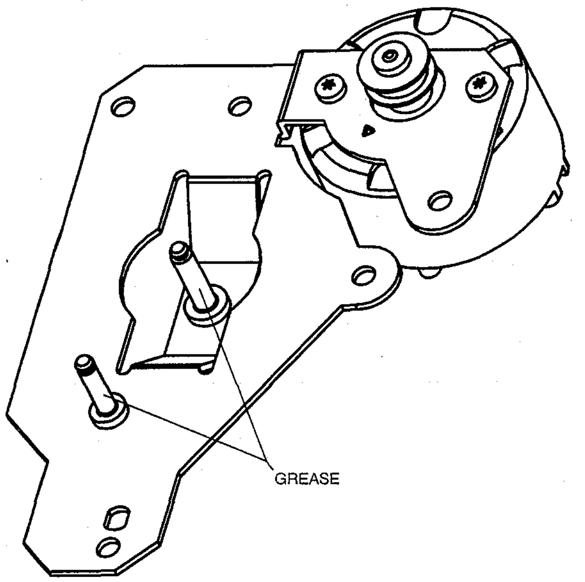
CHASSIS


grease
grease inside grove
grease on top of rib
grease

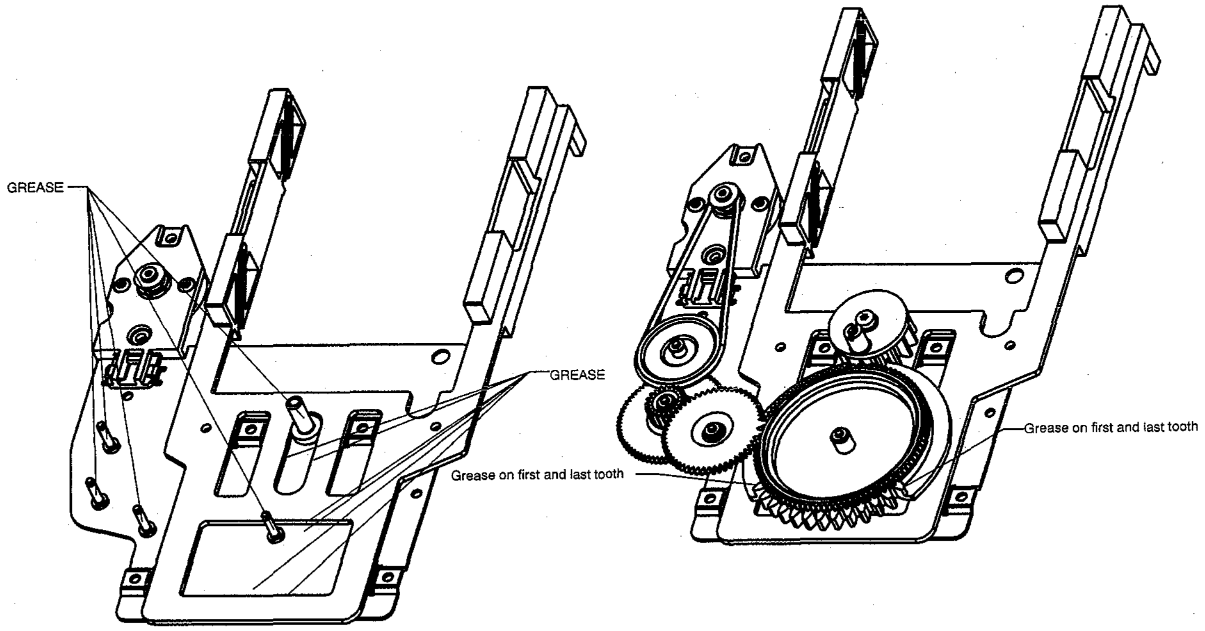
DRAWER


grease on 4 rectangular surfaces
grease inside groves
grease on slide
grease on 4 profile groves
grease on top of highest ring

DRAWER MECHANISM

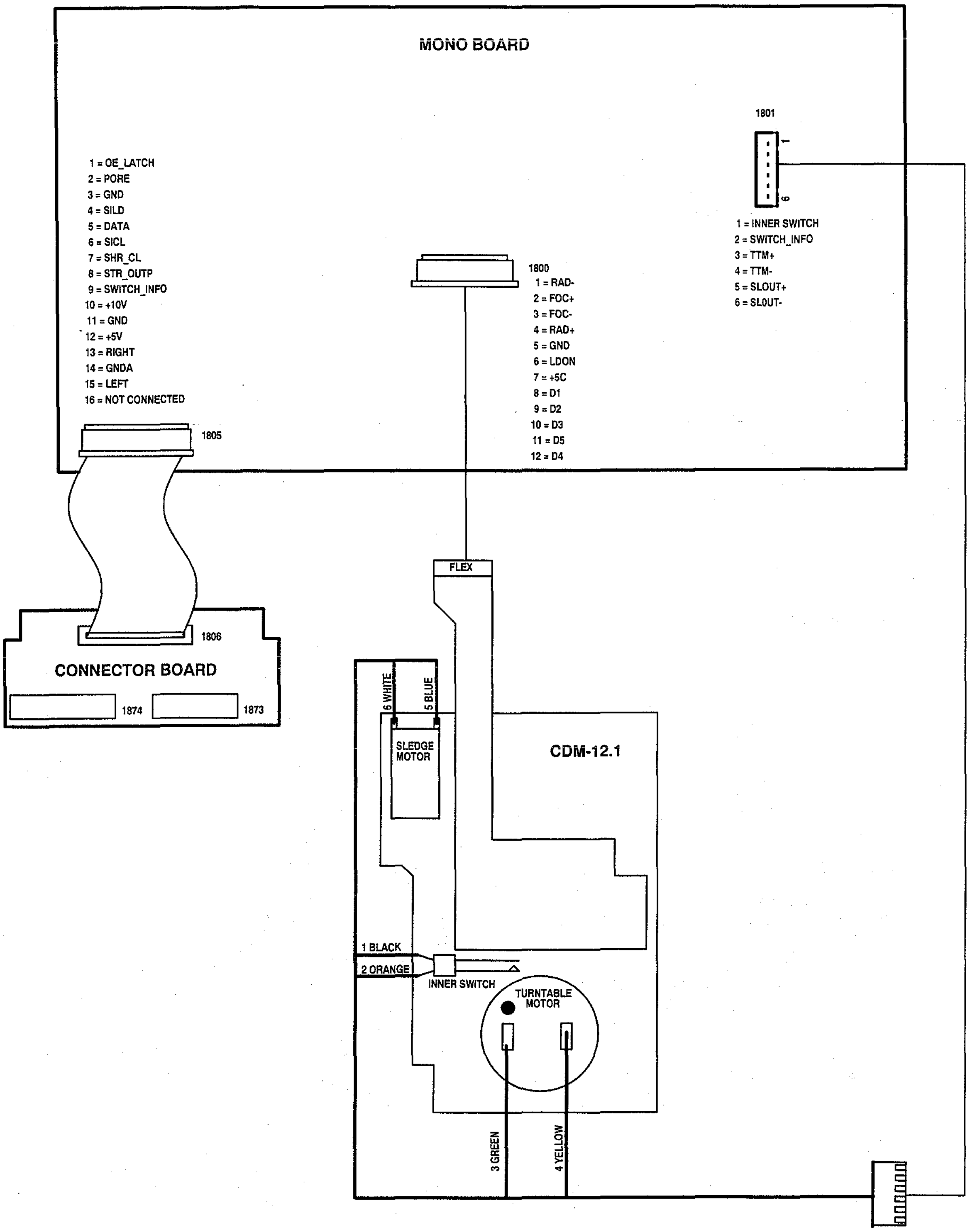


DISC-CHANGE MECHANISM

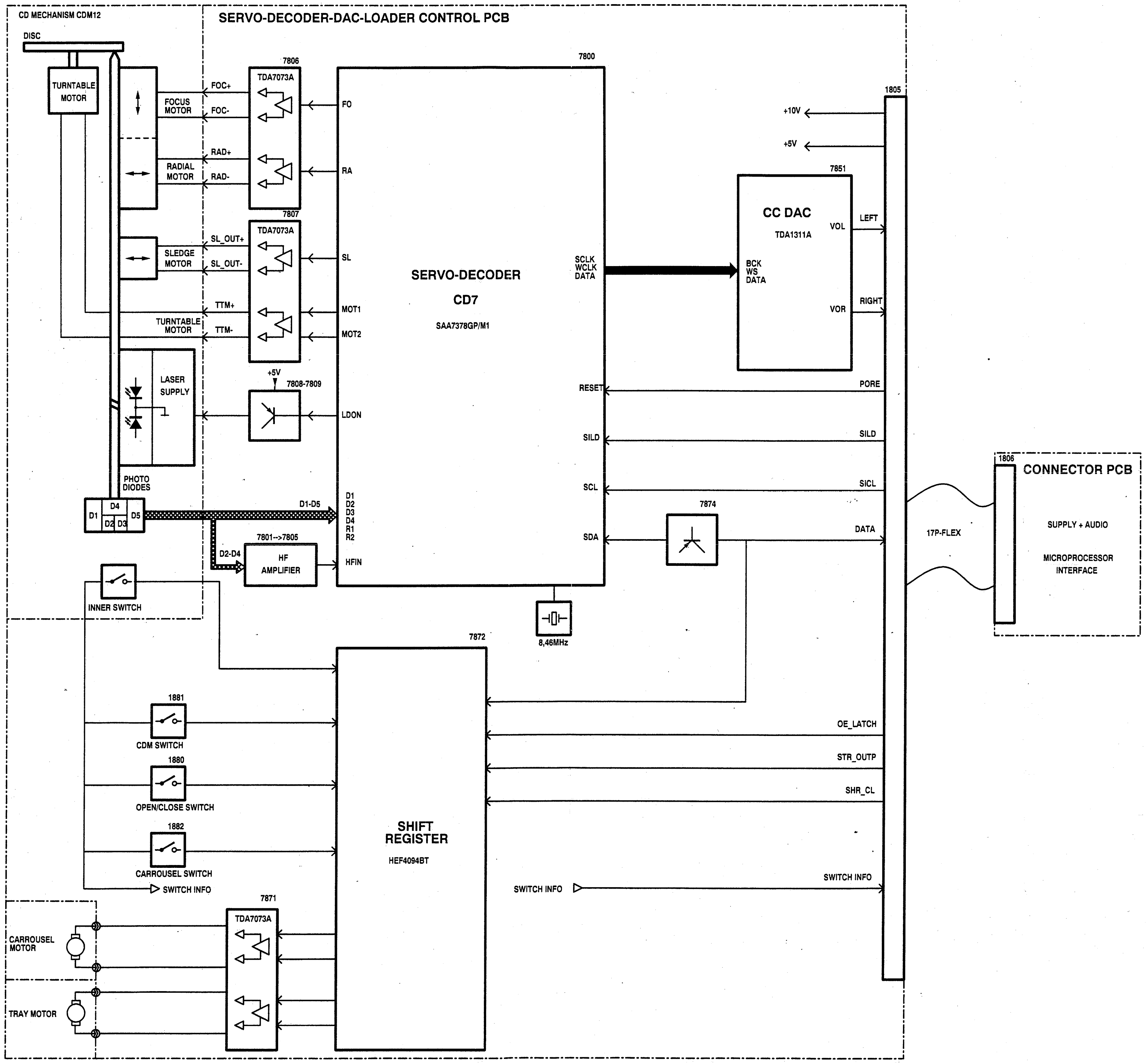

GREASE
GREASE
Grease on first and last tooth
Grease on first and last tooth

Use only grease **Polylub GLY 801** service codenumber 4822 390 10136

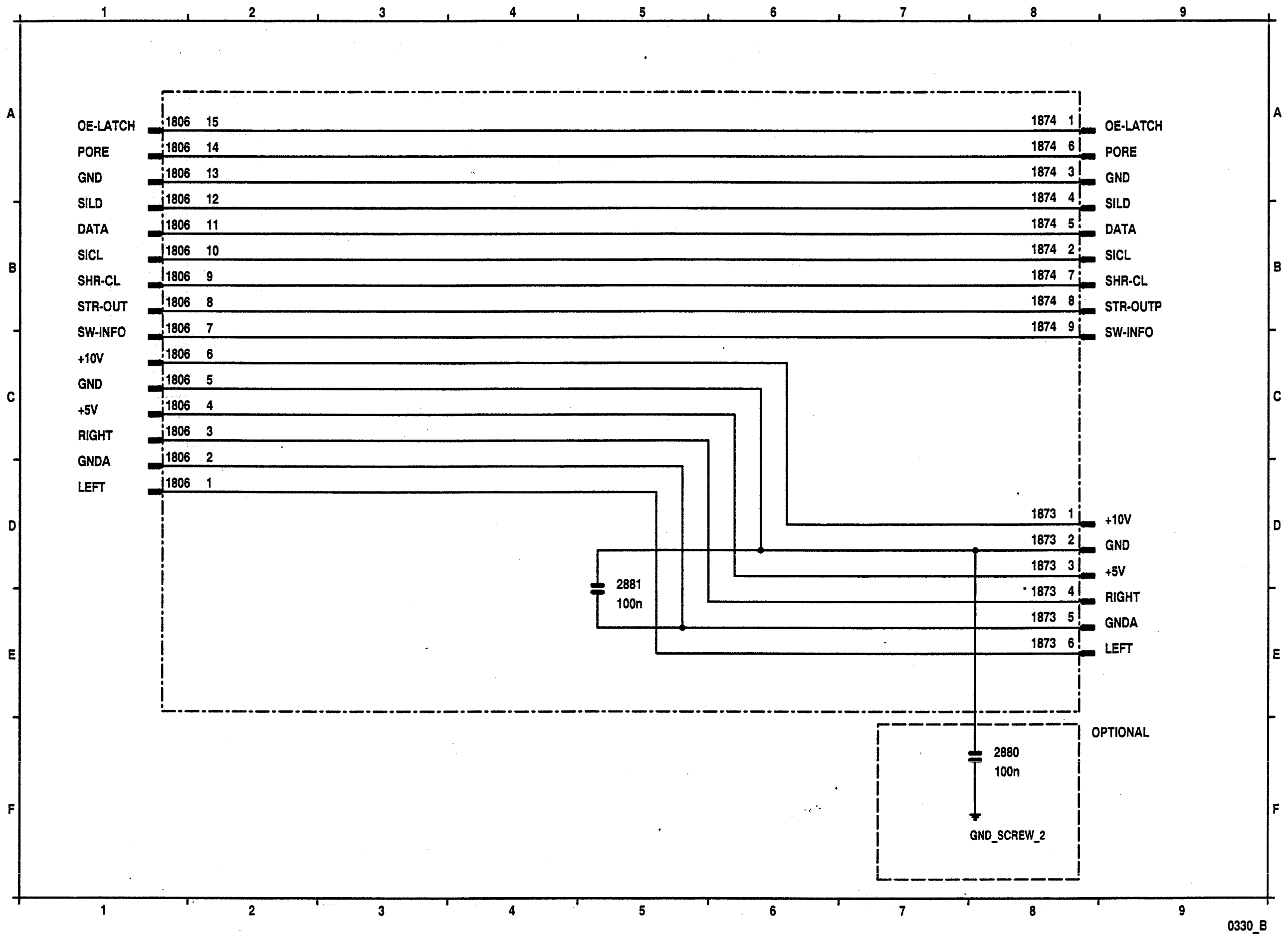
WIRING DIAGRAM


MONO BOARD
1801
1
6
1 = INNER SWITCH
2 = SWITCH_INFO
3 = TTM+
4 = TTM-
5 = SLOUT+
6 = SLOUT-
1 = OE_LATCH
2 = PORE
3 = GND
4 = SILD
5 = DATA
6 = SICL
7 = SHR_CL
8 = STR_OUTP
9 = SWITCH_INFO
10 = +10V
11 = GND
12 = +5V
13 = RIGHT
14 = GNDA
15 = LEFT
16 = NOT CONNECTED
1805
1800
1 = RAD-
2 = FOC+
3 = FOC-
4 = RAD+
5 = GND
6 = LDON
7 = +5C
8 = D1
9 = D2
10 = D3
11 = D5
12 = D4
FLEX
1806
CONNECTOR BOARD
1874
1873
6 WHITE
5 BLUE
SLEDGE MOTOR
CDM-12.1
1 BLACK
2 ORANGE
INNER SWITCH
TURNTABLE MOTOR
3 GREEN
4 YELLOW

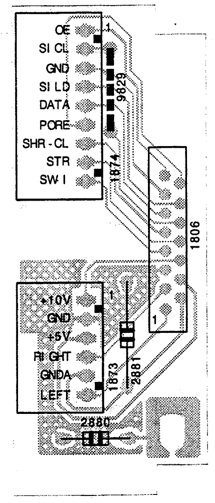
BLOCK DIAGRAM


CD MECHANISM CDM12
SERVO-DECODER-DAC-LOADER CONTROL PCB
DISC
TURNTABLE MOTOR
FOCUS MOTOR
FOC+
FOC-
RADIAL MOTOR
RAD+
RAD-
SLEDGE MOTOR
SL_OUT+
SL_OUT-
TURNTABLE MOTOR
TTM+
TTM-
LASER SUPPLY
PHOTO DIODES
D1
D2
D3
D4
D5
D1-D5
D2-D4
7806
TDA7073A
7807
TDA7073A
+5V
7808-7809
7801-->7805
HF AMPLIFIER
7800
FO
RA
SL
MOT1
MOT2
LDON
D1
D2
D3
D4
R1
R2
HFIN
SERVO-DECODER
CD7
SAA7378GP/M1
SCLK
WCLK
DATA
RESET
SILD
SCL
SDA
8,46MHz
7851
CC DAC
TDA1311A
BCK
WS
DATA
VOL
VOR
LEFT
RIGHT
+10V
+5V
PORE
SILD
SICL
DATA
7874
1805
17P-FLEX
1806
CONNECTOR PCB
SUPPLY + AUDIO
MICROPROCESSOR INTERFACE
INNER SWITCH
7872
SHIFT REGISTER
HEF4094BT
1881
CDM SWITCH
1880
OPEN/CLOSE SWITCH
1882
CARROUSEL SWITCH
SWITCH INFO
SWITCH INFO
SWITCH INFO
OE_LATCH
STR_OUTP
SHR_CL
7871
TDA7073A
CARROUSEL MOTOR
TRAY MOTOR

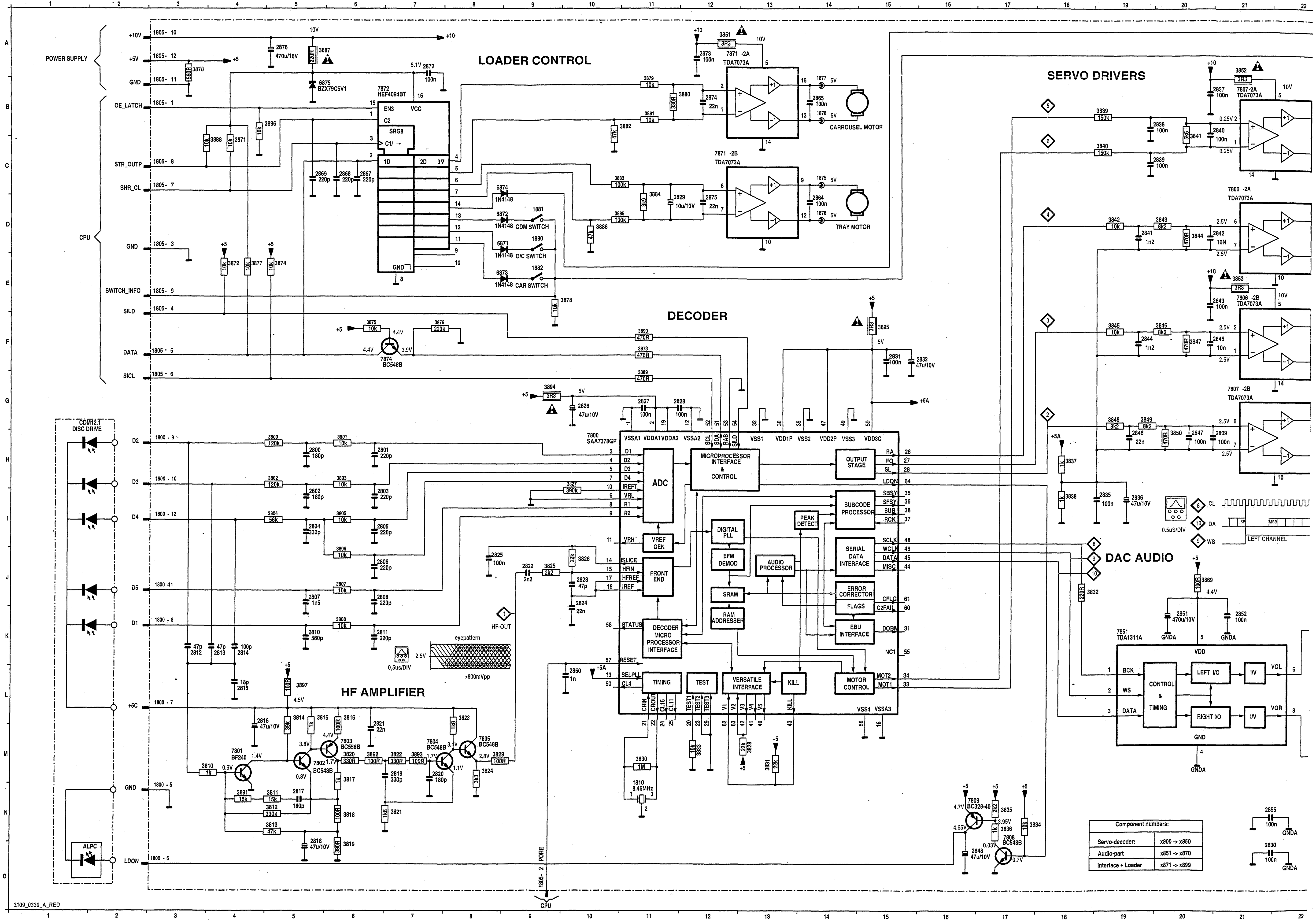
CONNECTOR WIRING AND LAYOUT


OE-LATCH
PORE
GND
SILD
DATA
SICL
SHR-CL
STR-OUT
SW-INFO
+10V
GND
+5V
RIGHT
GNDA
LEFT
1806 15
1806 14
1806 13
1806 12
1806 11
1806 10
1806 9
1806 8
1806 7
1806 6
1806 5
1806 4
1806 3
1806 2
1806 1
1874 1
1874 6
1874 3
1874 4
1874 5
1874 2
1874 7
1874 8
1874 9
OE-LATCH
PORE
GND
SILD
DATA
SICL
SHR-CL
STR-OUTP
SW-INFO
1873 1
1873 2
1873 3
1873 4
1873 5
1873 6
+10V
GND
+5V
RIGHT
GNDA
LEFT
2881
100n
OPTIONAL
2880
100n
GND_SCREW_2
0330_B

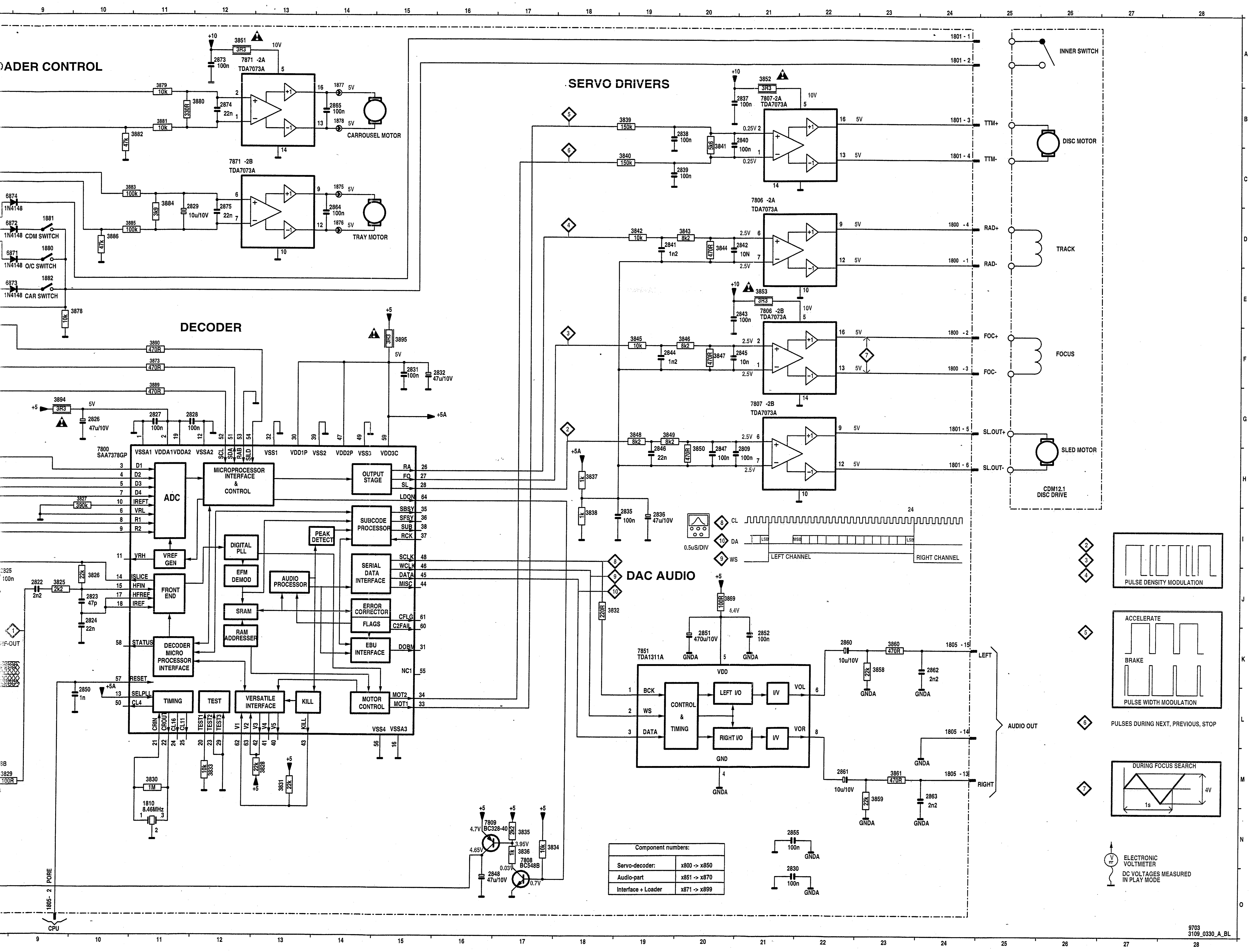
1806	D 1
1806	D 1
1806	C 1
1806	C 1
1806	C 1
1806	C 1
1806	C 1
1806	B 1
1806	B 1
1806	B 1
1806	B 1
1806	B 1
1806	A 1
1806	A 1
1806	A 1
1873	D 8
1873	D 8
1873	D 8
1873	E 8
1873	E 8
1873	E 8
1874	A 8
1874	B 8
1874	A 8
1874	B 8
1874	B 8
1874	A 8
1874	B 8
1874	B 8
1874	C 8
2880	F 8
2881	D 5


OE
SI CL
GND
SI LD
DATA
PORE
SHR - CL
STR
SW I
9829
1874
1806
+10V
GND
+5V
RI GHT
GNDA
LEFT
1873
2881
2880

CDC-3 CIRCUIT


LOADER CONTROL
DECODER
SERVO DRIVERS
HF AMPLIFIER
DAC AUDIO
POWER SUPPLY
CPU
+10V
+5V
GND
OE_LATCH
STR_OUTP
SHR_CL
SWITCH_INFO
SILD
DATA
SICL
CDM12.1 DISC DRIVE
D2
D3
D4
D5
D1
+5C
LDON
ALPC
7872 HEF4094BT
SRG8
7871 -2A TDA7073A
7871 -2B TDA7073A
CARROUSEL MOTOR
TRAY MOTOR
1881 CDM SWITCH
1880 O/C SWITCH
1882 CAR SWITCH
7874 BC548B
7800 SAA7378GP
ADC
MICROPROCESSOR INTERFACE & CONTROL
OUTPUT STAGE
SUBCODE PROCESSOR
PEAK DETECT
DIGITAL PLL
EFM DEMOD
AUDIO PROCESSOR
SERIAL DATA INTERFACE
SRAM
ERROR CORRECTOR
FLAGS
RAM ADDRESSER
EBU INTERFACE
VREF GEN
FRONT END
DECODER MICRO PROCESSOR INTERFACE
TIMING
TEST
VERSATILE INTERFACE
KILL
MOTOR CONTROL
1810 8.46MHz
7801 BF240
7802 BC548B
7803 BC558B
7804 BC548B
7805 BC548B
eyepattern
>800mVpp
0,5us/DIV
HF-OUT
7806 -2A TDA7073A
7806 -2B TDA7073A
7807 -2A TDA7073A
7807 -2B TDA7073A
7809 BC328-40
7808 BC548B
7851 TDA1311A
CONTROL & TIMING
LEFT I/O
RIGHT I/O
I/V
VOL
VOR
BCK
WS
DATA
CL
DA
LEFT CHANNEL
0.5uS/DIV
1805 - 2 PORE
CPU
3109_0330_A_RED

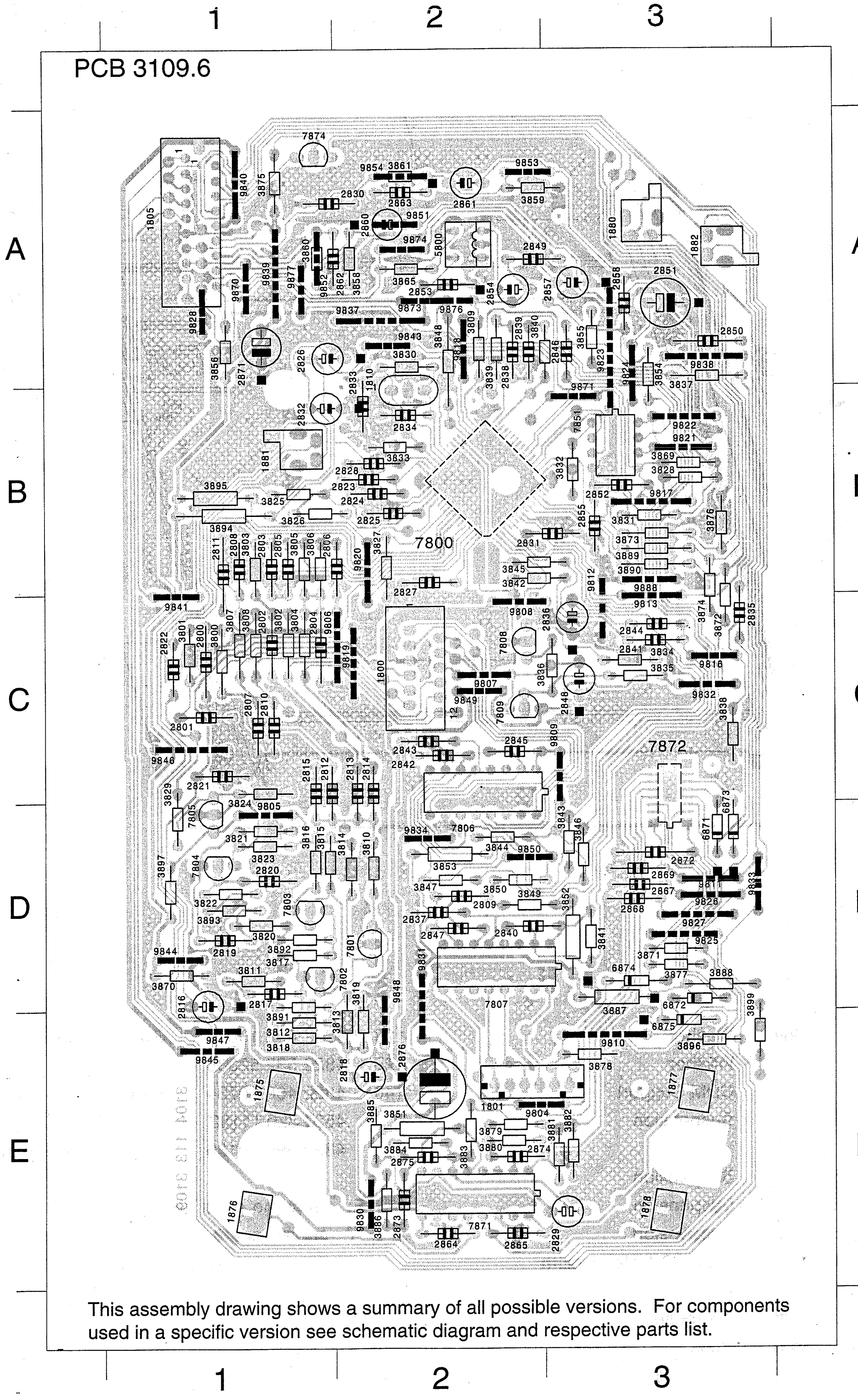
Component numbers:	
Servo-decoder:	x800 -> x850
Audio-part	x851 -> x870
Interface + Loader	x871 -> x899


ADER CONTROL
CARROUSEL MOTOR
TRAY MOTOR
CDM SWITCH
O/C SWITCH
CAR SWITCH
7871 -2A TDA7073A
7871 -2B TDA7073A
DECODER
7800 SAA7378GP
ADC
MICROPROCESSOR INTERFACE & CONTROL
OUTPUT STAGE
SUBCODE PROCESSOR
PEAK DETECT
DIGITAL PLL
EFM DEMOD
AUDIO PROCESSOR
SERIAL DATA INTERFACE
ERROR CORRECTOR
FLAGS
SRAM
RAM ADDRESSER
EBU INTERFACE
VREF GEN
FRONT END
DECODER MICRO PROCESSOR INTERFACE
TIMING
TEST
VERSATILE INTERFACE
KILL
MOTOR CONTROL
1810 8.46MHz
7809 BC328-40
7808 BC548B
SERVO DRIVERS
7807 -2A TDA7073A
7806 -2A TDA7073A
7806 -2B TDA7073A
7807 -2B TDA7073A
INNER SWITCH
DISC MOTOR
TRACK
FOCUS
SLED MOTOR
CDM12.1 DISC DRIVE
TTM+
TTM-
RAD+
RAD-
FOC+
FOC-
SL.OUT+
SL.OUT-
DAC AUDIO
CL
DA
WS
0.5uS/DIV
LEFT CHANNEL
RIGHT CHANNEL
7851 TDA1311A
CONTROL & TIMING
LEFT I/O
RIGHT I/O
LEFT
RIGHT
AUDIO OUT
PULSE DENSITY MODULATION
ACCELERATE
BRAKE
PULSE WIDTH MODULATION
PULSES DURING NEXT, PREVIOUS, STOP
DURING FOCUS SEARCH
ELECTRONIC VOLTMETER
DC VOLTAGES MEASURED IN PLAY MODE
CPU
9703
3109_0330_A_BL

Component numbers:	
Servo-decoder:	x800 -> x850
Audio-part	x851 -> x870
Interface + Loader	x871 -> x899

1800	D24
1800	F24
1800	F24
1800	D24
1800	N 3
1800	O 3
1800	L 3
1800	K 3
1800	H 3
1800	H 3
1800	J 3
1800	I 3
1801	A24
1801	A24
1801	B24
1801	C24
1801	G24
1801	H24
1805	B 3
1805	O 9
1805	D 3
1805	E 3
1805	F 3
1805	G 3
1805	C 3
1805	C 3
1805	E 3
1805	A 3
1805	B 3
1805	A 3
1805	M24
1805	L24
1805	K24
1810	N11
1880	D 9
1881	D 9
1882	E 9
2800	H 5
2801	H 6
2802	I 5
2803	I 6
2804	I 5
2805	I 6
2806	J 6
2807	J 5
2808	J 6
2809	H21
2810	K 5
2811	K 6
2812	K 3
2813	K 4
2814	K 4
2815	L 4
2816	L 4
2817	N 5
2818	O 5
2819	M 7
2820	M 7
2821	M 6
2822	J 9
2823	J10
2824	J10
2825	J 8
2826	G10
2827	G11
2828	G11
2829	D11
2830	O21
2831	F15
2832	F16
2835	I19
2836	I19
2837	B20
2838	B19
2839	C19
2840	B20
2841	D19
2842	D20
2843	E20
2844	F19
2845	F20
2846	H19
2847	H20
2848	O16
2850	L10
2851	K20
2852	K21
2855	N21
2860	K22
2861	M22
2862	K24
2863	M24
2864	D14
2865	B14
2867	C 6
2868	C 6
2869	C 5
2872	A 7
2873	A12
2874	B12
2875	D12
2876	A 5
3800	H 5
3801	H 6
3802	H 5
3803	H 6
3804	I 5
3805	I 6
3806	J 6
3807	J 6
3808	K 6
3810	M 4
3811	N 5
3812	N 5
3813	N 5
3814	L 5
3815	L 5
3816	L 6
3817	M 6
3818	N 6
3819	O 6
3820	M 6
3821	N 7
3822	M 7
3823	L 8
3824	M 8
3825	J 9
3826	J10
3827	H10
3828	M13
3829	M 8
3830	M11
3831	M13
3832	J18
3833	M12
3834	N18
3835	N17
3836	N17
3837	H18
3838	I18
3839	B19
3840	C19
3841	C20
3842	D19
3843	D20
3844	D20
3845	F19
3846	F20
3847	F20
3848	G19
3849	G19
3850	H20
3851	A12
3852	A21
3853	E21
3858	K23
3859	M23
3860	K23
3861	M23
3869	J20
3870	A 3
3871	C 4
3872	E 4
3873	F11
3874	E 5
3875	F 6
3876	F 7
3877	E 4
3878	E 9
3879	B11
3880	B11
3881	B11
3882	B10
3883	C10
3884	D11
3885	D10
3886	D10
3887	A 5
3888	C 4
3889	G11
3890	F11
3891	N 4
3892	M 6
3893	M 7
3894	G 9
3895	F15
3896	B 4
3897	L 5
6871	D 9
6872	D 9
6873	E 9
6874	C 9
6875	B 6
7800	H10
7801	M 4
7802	M 5
7803	M 6
7804	M 7
7805	M 8
7806	E21
7806	C21
7807	B21
7807	G21
7808	N17
7809	N17
7851	K19
7871	A12
7871	C12
7872	B 6
7874	F 6

CDC-3 COMPONENT LAYOUT

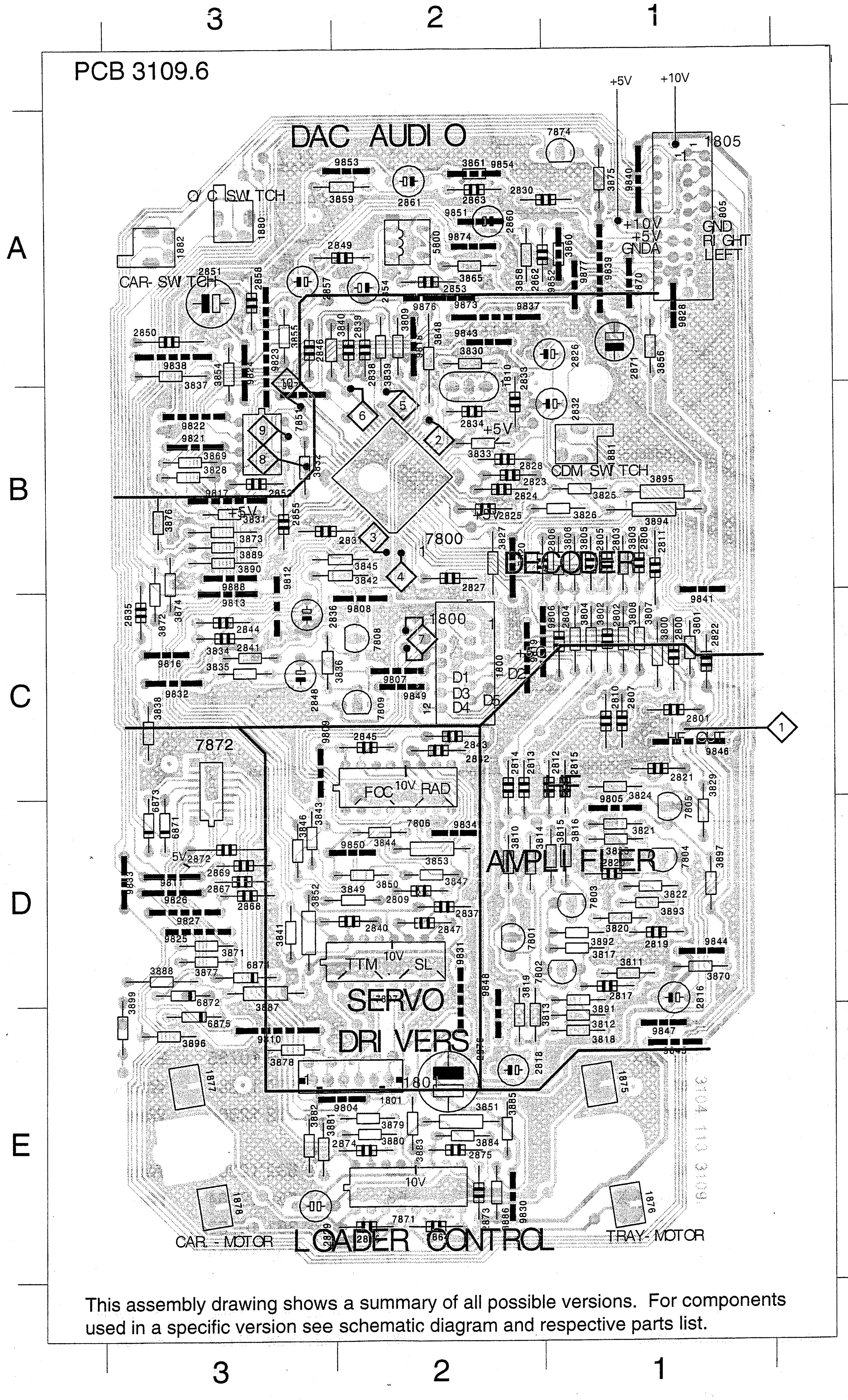

PCB 3109.6
1
2
3
A
B
C
D
E
7800
7872
7807
7871
1800
1801
1805
1875
1876
1877
1878
1880
1881
1882
3104 113 3109

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

1800	C	2
1801	E	2
1805	A	1
1810	B	2
1875	E	1
1876	E	1
1877	E	3
1878	E	3
1880	A	3
1881	B	1
1882	A	3
2800	C	1
2801	C	1
2802	C	1
2803	B	1
2804	C	1
2805	B	1
2806	B	2
2807	C	1
2808	B	1
2809	D	2
2810	C	1
2811	B	1
2812	C	1
2813	C	2
2814	C	2
2815	C	1
2816	D	1
2817	D	1
2818	E	2
2819	D	1
2820	D	1
2821	C	1
2822	C	1
2823	B	2
2824	B	2
2825	B	2
2826	A	1
2827	B	2
2828	B	2
2829	E	3
2830	A	1
2831	B	3
2832	B	1
2833	B	2
2834	B	2
2835	C	3
2836	C	3
2837	D	2
2838	A	2
2839	A	2
2840	D	2
2841	C	3
2842	C	2
2843	C	2
2844	C	3
2845	C	2
2846	A	3
2847	D	2
2848	C	3
2849	A	2
2850	A	3
2851	A	3
2852	B	3
2853	A	2
2854	A	2
2855	B	3
2857	A	3
2858	A	3
2860	A	2
2861	A	2
2862	A	1
2863	A	2
2864	E	2
2865	E	2
2867	D	3
2868	D	3
2869	D	3
2871	A	1
2872	D	3
2873	E	2
2874	E	2
2875	E	2
2876	E	2
3800	C	1
3801	C	1
3802	C	1
3803	B	1
3804	C	1
3805	B	1
3806	B	1
3807	C	1
3808	C	1
3809	A	2
3810	D	2
3811	D	1
3812	E	1
3813	E	2
3814	D	2
3815	D	1
3816	D	1
3817	D	1
3818	E	1
3819	E	2
3820	D	1
3821	D	1
3822	D	1
3823	D	1
3824	C	1
3825	B	1
3826	B	1
3827	B	2
3828	B	3
3829	D	1
3830	A	2
3831	B	3
3832	B	3
3833	B	2
3834	C	3
3835	C	3
3836	C	3
3837	A	3
3838	C	3
3839	A	2
3840	A	3
3841	D	3
3842	B	2
3843	D	3
3844	D	2
3845	B	2
3846	D	3
3847	D	2
3848	A	2
3849	D	2
3850	D	2
3851	E	2
3852	D	3
3853	D	2
3854	A	3
3855	A	3
3856	A	1
3858	A	2
3859	A	2
3860	A	1
3861	A	2
3865	A	2
3869	B	3
3870	D	1
3871	D	3
3872	C	3
3873	B	3
3874	B	3
3875	A	1
3876	B	3
3877	D	3
3878	E	3
3879	E	2
3880	E	2
3881	E	3
3882	E	3
3883	E	2
3884	E	2
3885	E	2
3886	E	2
3887	D	3
3888	D	3
3889	B	3
3890	B	3
3891	D	1
3892	D	1
3893	D	1
3894	B	1
3895	B	1
3896	E	3
3897	D	1
3899	E	3
5800	A	2
6871	D	3
6872	D	3
6873	D	3
6874	D	3
6875	E	3
7801	D	2
7802	D	1
7803	D	1
7804	D	1
7805	D	1
7806	C	2
7807	D	2
7808	C	2
7809	C	2
7851	B	3
7871	E	2
7874	A	1
9804	E	2
9805	D	1
9806	C	2
9807	C	2
9808	C	2
9809	C	3
9810	E	3
9811	D	3
9812	C	3
9813	C	3
9816	C	3
9817	B	3
9818	A	2
9819	C	2
9820	B	2
9821	B	3
9822	B	3
9823	A	3
9824	A	3
9825	D	3
9826	D	3
9827	D	3
9828	A	1
9830	E	2
9831	D	2
9832	C	3
9833	D	3
9834	D	2
9837	A	2
9838	A	3
9839	A	1
9840	A	1
9841	C	1
9843	A	2
9844	D	1
9845	E	1
9846	C	1
9847	E	1
9848	E	2
9849	C	2
9850	D	2
9851	A	2
9852	A	1
9853	A	2
9854	A	2
9870	A	1
9871	B	3
9873	A	2
9874	A	2
9876	A	2
9877	A	1
9888	B	3

CDC-3 CHIP LAYOUT

7800	B	2
7872	C	3


PCB 3109.6
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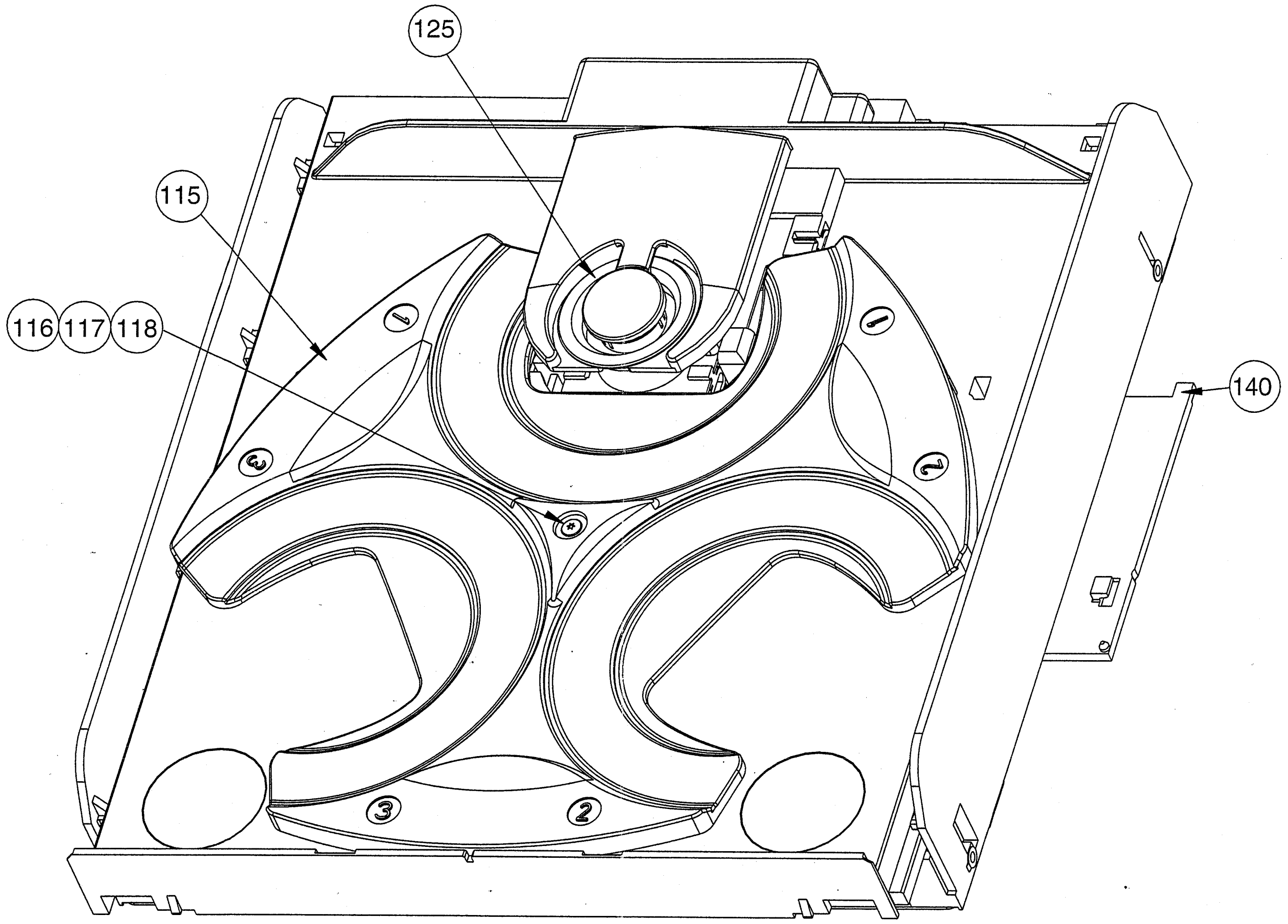
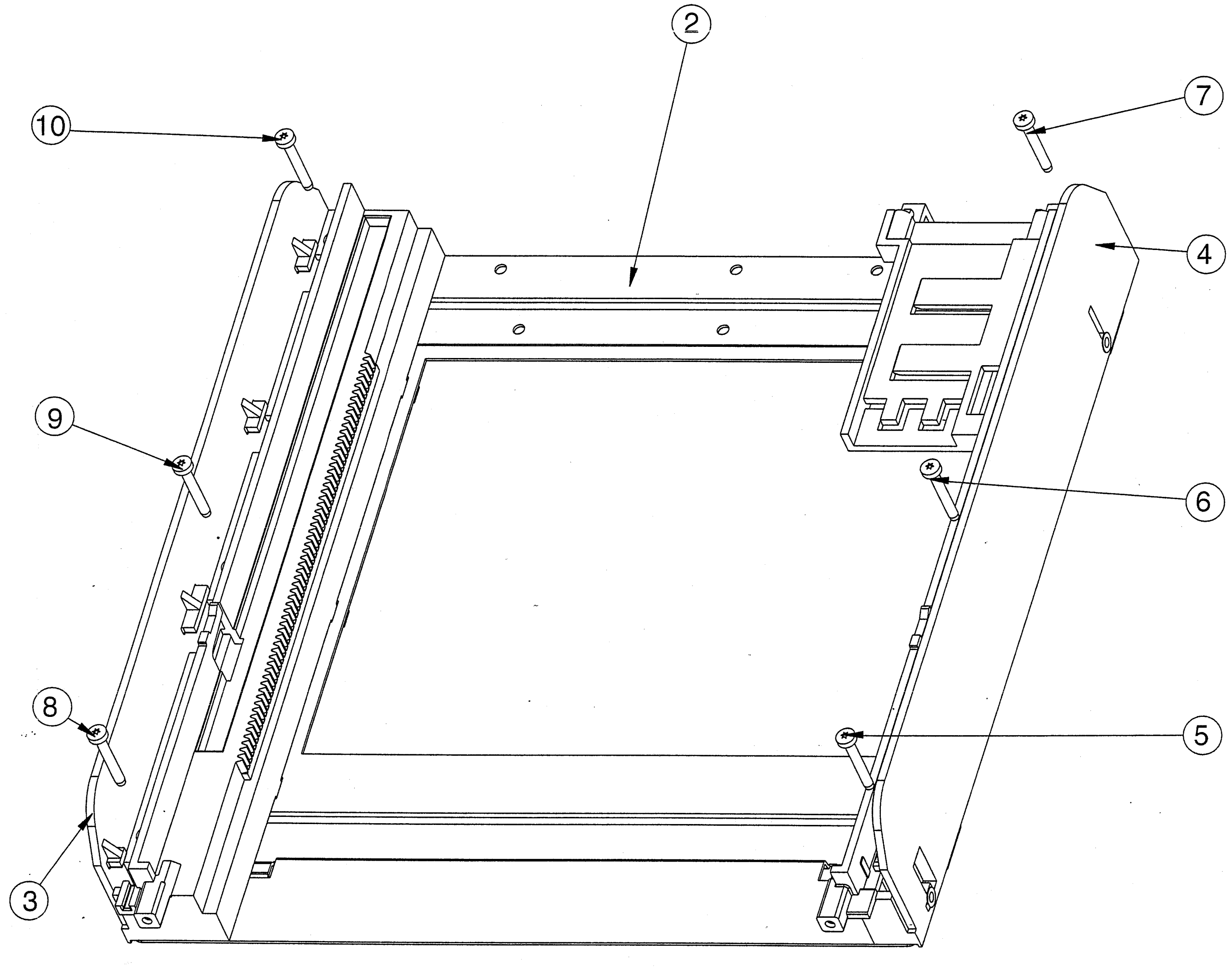
B
C
D
E
DAC AUDIO
+5V
+10V
1805
GND
RIGHT
LEFT
+10V
+5V
GNDA
O/C SWITCH
CAR-SWITCH
CDM SWITCH
7800
DECODER
1800
D1
D2
D3
D4
D5
HF-OUT
7872
FOC
10V
RAD
AMPLIFIER
TTM
SL
SERVO
DRIVERS
CAR-MOTOR
LOADER CONTROL
TRAY-MOTOR
3104 113 3109

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

CDC EXPLODED VIEW I

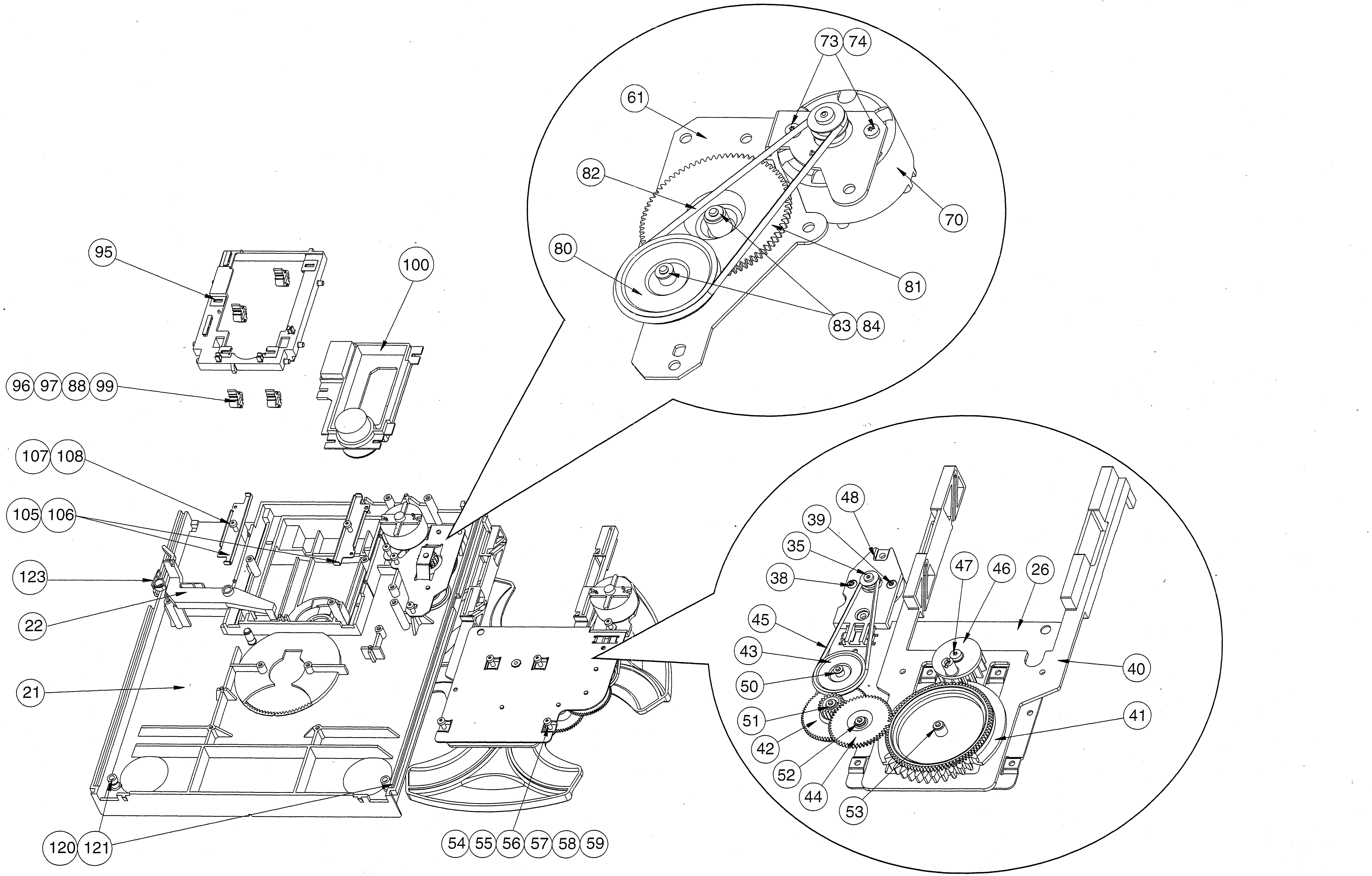




3	4822 463 11008	Guide Left
4	4822 463 11009	Guide Right
21	4822 441 11615	Drawer
22	4822 402 10088	Tumbler
35	4822 361 10753	Carrousel Motor
38	4822 502 12548	Screw M2,6 X 3,5
39	4822 502 12548	Screw M2,6 X 3,5
40	4822 463 11011	Slide
41	4822 522 10509	Control Disc
42	4822 522 10492	Gear Wheel
43	4822 528 10937	Pulley
44	4822 522 10493	Idler Wheel
45	4822 358 10115	Belt
46	4822 466 10735	Eccentric Gear Wheel
50	4822 532 12364	Washer
51	4822 532 12364	Washer
52	4822 532 12364	Washer
53	4822 532 12364	Washer
70	4822 361 10753	Tray Motor
73	4822 502 12548	Screw M 2,6 X 3,5
74	4822 502 12548	Screw M 2,6 X 3,5
80	4822 528 10937	Pulley
81	4822 522 10494	Gear Wheel
82	4822 358 10115	Belt
83	4822 532 12364	Washer
84	4822 532 12364	Washer
95	4822 404 10894	CDM Support
96	4822 325 50215	Suspension
97	4822 325 50215	Suspension
98	4822 325 50215	Suspension
99	4822 325 50215	Suspension
100	4822 691 30278	CDM-12.1 Mechanism
115	4822 466 10736	Carrousel
117	4822 532 12365	Bush
120	4822 532 51756	Damping Grommet
121	4822 532 51756	Damping Grommet
123	4822 402 10085	Switch Bracket
125	4822 532 52386	Clamper
140	4822 466 10734	Flex Cable Protection Plate
	4822 320 11183	Flexfoil 17P
	4822 390 10136	Lub. Grease Polylub GLY801

NOTE: Only the parts mentioned in this list are normal service spare parts.

CDC EXPLODED VIEW II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ELECTRICAL PARTS LIST - CDC BOARD

MISCELLANEOUS

1810	4822 242 73557	Ceram Resonator 8.46MHz
1880	4822 276 13503	Open/Close Switch
1881	4822 276 13503	CDM Position Switch
1882	4822 276 13503	Carrousel Switch
8002	4822 320 11313	Flexfoil 15 Pin

CAPACITORS

2800	4822 126 10053	180pF 10%
2801	4822 122 10466	220pF 10% 50V
2802	4822 126 10053	180pF 10%
2803	4822 122 10466	220pF 10% 50V
2804	4822 126 12787	330pF 10% 50V
2805	4822 122 10466	220pF 10% 50V
2806	4822 122 10466	220pF 10% 50V
2807	4822 126 12878	1,5nF 10% 16V
2808	4822 122 10466	220pF 10% 50V
2809	4822 126 12882	100nF +80 / -20% 50V
2810	4822 122 10459	560pF 10% 50V
2811	4822 122 10466	220pF 10% 50V
2812	4822 122 33848	47pF 5% 50V
2813	4822 122 33848	47pF 5% 50V
2814	4822 122 33195	100pF 10% 50V
2815	4822 126 12573	18pF 5% 50V
2816	4822 124 23624	47µF 20% 16V
2817	4822 126 10053	180pF 10%
2818	4822 124 23624	47µF 20% 16V
2819	4822 126 12787	330pF 10% 50V
2820	4822 126 10053	180pF 10%
2821	4822 126 11585	22nF +80 / -20% 25V
2822	4822 126 12339	2,2nF 10%
2823	4822 122 33848	47pF 5% 50V
2824	4822 126 11585	22nF +80 / -20% 25V
2825	4822 126 12882	100nF +80 / -20% 50V
2826	4822 124 23624	47µF 20% 16V
2827	4822 126 12882	100nF +80 / -20% 50V
2828	4822 126 12882	100nF +80 / -20% 50V
2829	4822 124 80865	10µF 20% 25V
2830	4822 126 12882	100nF +80 / -20% 50V
2831	4822 126 12882	100nF +80 / -20% 50V
2832	4822 124 23624	47µF 20% 16V
2835	4822 126 12882	100nF +80 / -20% 50V
2836	4822 124 23624	47µF 20% 16V
2837	4822 126 12882	100nF +80 / -20% 50V
2838	4822 126 12882	100nF +80 / -20% 50V
2839	4822 126 12882	100nF +80 / -20% 50V
2840	4822 126 12882	100nF +80 / -20% 50V
2841	4822 122 10574	1,2nF 10% 16V
2842	4822 121 51387	10nF 20% 16V
2843	4822 126 12882	100nF +80 / -20% 50V
2844	4822 122 10574	1,2nF 10% 16V
2845	4822 121 51387	10nF 20% 16V
2846	4822 126 11585	22nF +80 / -20% 25V
2847	4822 126 12882	100nF +80 / -20% 50V
2848	4822 124 23624	47µF 20% 16V
2850	4822 122 33197	1nF 10% 50V
2851	4822 124 41997	470µF 10V
2852	4822 126 12882	100nF +80 / -20% 50V
2855	4822 126 12882	100nF +80 / -20% 50V
2860	4822 124 41579	10µF 20% 50V
2861	4822 124 41579	10µF 20% 50V
2862	4822 126 12339	2,2nF 10%
2863	4822 126 12339	2,2nF 10%
2864	4822 126 12882	100nF +80 / -20% 50V
2865	4822 126 12882	100nF +80 / -20% 50V
2867	4822 122 10466	220pF 10% 50V
2868	4822 122 10466	220pF 10% 50V
2869	4822 122 10466	220pF 10% 50V
2872	4822 126 12882	100nF +80 / -20% 50V
2873	4822 126 12882	100nF +80 / -20% 50V
2874	4822 126 11585	22nF +80 / -20% 25V
2875	4822 126 11585	22nF +80 / -20% 25V
2876	4822 124 23794	470µF 20% 16V

RESISTORS

3800	4822 116 52239	120k 5% 0,5W
3801	4822 116 83864	10k 5% 0,5W
3802	4822 116 52239	120k 5% 0,5W
3803	4822 116 83864	10k 5% 0,5W
3804	4822 116 52291	56k 5% 0,5W
3805	4822 116 83864	10k 5% 0,5W
3806	4822 116 83864	10k 5% 0,5W
3807	4822 116 83864	10k 5% 0,5W
3808	4822 116 83864	10k 5% 0,5W
3810	4822 050 11002	1k 1% 0,4W
3811	4822 116 52244	15k 5% 0,5W
3812	4822 116 52272	330k 5% 0,5W
3813	4822 116 83884	47k 5% 0,5W
3814	4822 116 83882	39k 5% 0,5W
3815	4822 050 11002	1k 1% 0,4W
3816	4822 116 52175	100R 5% 0,5W
3817	4822 050 11002	1k 1% 0,4W
3818	4822 116 52175	100R 5% 0,5W
3819	4822 116 52222	390R 5% 0,5W
3820	4822 116 52219	330R 5% 0,5W
3821	4822 116 52249	1k8 5% 0,5W
3822	4822 116 52219	330R 5% 0,5W
3823	4822 116 52249	1k8 5% 0,5W
3824	4822 116 52269	3k3 5% 0,5W
3825	4822 116 52256	2k2 5% 0,5W
3826	4822 116 52257	22k 5% 0,5W
3827	4822 116 52278	390k 5% 0,5W
3828	4822 116 52257	22k 5% 0,5W
3829	4822 116 52175	100R 5% 0,5W
3830	4822 116 52235	1M 5% 0,5W

ELECTRICAL PARTS LIST - CDC BOARD

3831	4822 116 52257	22k 5% 0,5W
3832	4822 116 83872	220R 5% 0,5W
3833	4822 116 83864	10k 5% 0,5W
3834	4822 116 83864	10k 5% 0,5W
3835	4822 116 52256	2k2 5% 0,5W
3836	4822 050 11002	1k 1% 0,4W
3837	4822 050 11002	1k 1% 0,4W
3838	4822 050 11002	1k 1% 0,4W
3839	4822 116 52245	150k 5% 0,5W
3840	4822 116 52245	150k 5% 0,5W
3841	4822 116 52289	5k6 5% 0,5W
3842	4822 116 83864	10k 5% 0,5W
3843	4822 116 52303	8k2 5% 0,5W
3844	4822 116 83883	470R 5% 0,5W
3845	4822 116 83864	10k 5% 0,5W
3846	4822 116 52303	8k2 5% 0,5W
3847	4822 116 83883	470R 5% 0,5W
3848	4822 116 52303	8k2 5% 0,5W
3849	4822 116 52303	8k2 5% 0,5W
3850	4822 116 83883	470R 5% 0,5W
3851	4822 052 10338	⚠ 3R3 5% 0,33W
3852	4822 052 10338	⚠ 3R3 5% 0,33W
3853	4822 052 10338	⚠ 3R3 5% 0,33W
3858	4822 116 52257	22k 5% 0,5W
3859	4822 116 52257	22k 5% 0,5W
3860	4822 116 83883	470R 5% 0,5W
3861	4822 116 83883	470R 5% 0,5W
3869	4822 116 52175	100R 5% 0,5W
3870	4822 116 52226	560R 5% 0,5W
3871	4822 116 83864	10k 5% 0,5W
3872	4822 116 83864	10k 5% 0,5W
3873	4822 116 83883	470R 5% 0,5W
3874	4822 116 83864	10k 5% 0,5W
3875	4822 116 83864	10k 5% 0,5W
3876	4822 116 83874	220k 5% 0,5W
3877	4822 116 83864	10k 5% 0,5W
3878	4822 116 83864	10k 5% 0,5W
3879	4822 116 83864	10k 5% 0,5W
3880	4822 116 52219	330R 5% 0,5W
3881	4822 116 83864	10k 5% 0,5W
3882	4822 116 83884	47k 5% 0,5W
3883	4822 116 52234	100k 5% 0,5W
3884	4822 116 52276	3k9 5% 0,5W
3885	4822 116 52234	100k 5% 0,5W
3886	4822 116 83884	47k 5% 0,5W
3887	4822 052 10221	⚠ 220R 5% 0,33W
3888	4822 116 83864	10k 5% 0,5W
3889	4822 116 83883	470R 5% 0,5W
3890	4822 116 83883	470R 5% 0,5W
3891	4822 116 52244	15k 5% 0,5W
3892	4822 116 52175	100R 5% 0,5W
3893	4822 116 52175	100R 5% 0,5W
3894	4822 052 10338	⚠ 3R3 5% 0,33W
3895	4822 052 10338	⚠ 3R3 5% 0,33W
3896	4822 116 83864	10k 5% 0,5W
3897	4822 116 52175	100R 5% 0,5W

DIODES

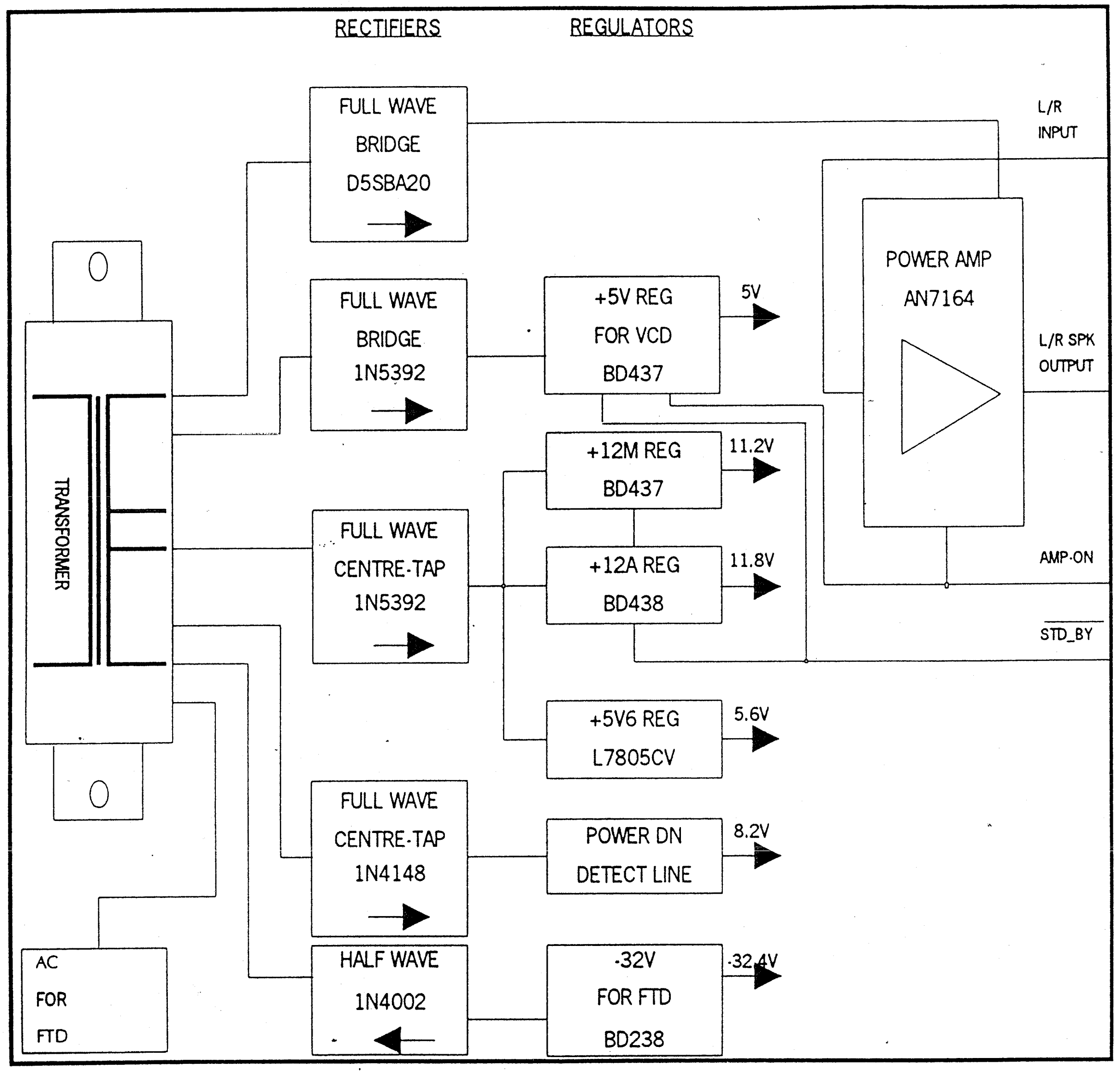
6871	4822 130 30621	1N4148
6872	4822 130 30621	1N4148
6873	4822 130 30621	1N4148
6874	4822 130 30621	1N4148
6875	4822 130 34233	BZX79-C5V1

TRANSISTORS & INTEGRATED CIRCUITS

7800	4822 209 12752	SAA7378GP/M1
7801	4822 130 40902	BF240
7802	4822 130 40937	BC548B
7803	4822 130 44197	BC558B
7804	4822 130 40937	BC548B
7805	4822 130 40937	BC548B
7806	4822 209 32852	TDA7073A/N2
7807	4822 209 32852	TDA7073A/N2
7808	4822 130 40937	BC548B
7809	4822 130 41715	BC328-40
7851	4822 209 32421	TDA1311A/N2
7871	4822 209 32852	TDA7073A/N2
7872	5322 209 11306	HEF4094BT
7874	4822 130 40937	BC548B

NOTE: Only the parts mentioned in this list are normal service spare parts.

POWER BOARD


RECTIFIERS
REGULATORS
FULL WAVE BRIDGE D5SBA20
FULL WAVE BRIDGE 1N5392
FULL WAVE CENTRE-TAP 1N5392
FULL WAVE CENTRE-TAP 1N4148
HALF WAVE 1N4002
+5V REG FOR VCD BD437
5V
+12M REG BD437
11.2V
+12A REG BD438
11.8V
+5V6 REG L7805CV
5.6V
POWER DN DETECT LINE
8.2V
-32V FOR FTD BD238
-32.4V
POWER AMP AN7164
L/R INPUT
L/R SPK OUTPUT
AMP-ON
STD_BY
TRANSFORMER
AC FOR FTD

WARNING : *If the power amplifier heatsink is not attached to the power amplifier during testing, do not make the amplifier deliver more than 500mW per channel. It is advisable to inject signal one channel at a time whenever possible and to remove all input signal immediately after test.*

CONNECTOR 12 TO 1210

o	1	PA	AC input to power amplifier rectifier
o	2	PA	AC input to power amplifier rectifier *[Note:Pin1 is shorted to Pin 2]*
o	3	PA	AC input to power amplifier rectifier
o	4	PA	AC input to power amplifier rectifier *[Note:Pin 3 is shorted to Pin 4]*
o	5	+12V/+5V6	AC input to +12V & +5V6 rectifier
o	6	GND	Centre-tap of secondary winding of Pin 5 ,7 and 8
o	7	+12V/+5V6	AC input to +12V & +5V6 rectifier
o	8	-35V	AC input to FTD rectifier
o	9	FTD	FTD filament voltage
o	10	FTD	FTD filament voltage

CONNECTOR 1222 — FTD SUPPLY AND uP CONTROL SIGNALS

o	1	STDBY	Standby signal from microprocessor
o	2	~F1	AC voltage for FTD filament
o	3	~F2	AC voltage for FTD filament
o	4	-32V	-32.4V voltage for FTD grid
o	5	$\overline{\text{PWD DN}}$	Power down signal to microprocessor

CONNECTOR 1223 — AF SIGNAL AND SUPPLY

o	1	L	Left input for power amplifier
o	2	⊥ a	AF ground
o	3	R	Right input for power amplifier
o	4	AMP_ON	Control from up to switch power amplifier and VCD regulator to standby
o	5	+12M	+12V for tapedeck motors and CD mechanisms
o	6	⊥ B	Ground for +12A
o	7	+12A	+12V for analog circuitries
o	8	⊥ D	Motor and Digital ground
o	9	+5V6	+5V6 for set uP and VCD uP

CONNECTOR 1224 — AF SIGNAL AND SUPPLY *[OPTION]*

[Connections as 1223 but with digital ground and motor ground seperated]

o	1	L	Left input for power amplifier
o	2	⊥ a	AF ground
o	3	R	Right input for power amplifier
o	4	AMP_ON	Control from uP to switch power amplifier and VCD regulator to standby
o	5	+12A	+12V for analog circuitries
o	6	⊥ B	Ground for +12A
o	7	+12M	+12V for tapedeck motors and CD mechanisms
o	8	⊥ M	Motor ground
o	9	+5V6	+5V6 for set up and VCD up
o	10	⊥ D	Digital ground

CONNECTOR 1237 — VCD SUPPLY *[OPTION]*

o	1	+VCD	+5V for VCD module
o	2	+VCD	+5V for VCD module
o	3	+Vsl	+5V for VCD uP-SRAM
o	4	GND	Ground
o	5	GND	Ground
o	6	+VA	+12V for VCD servo drivers

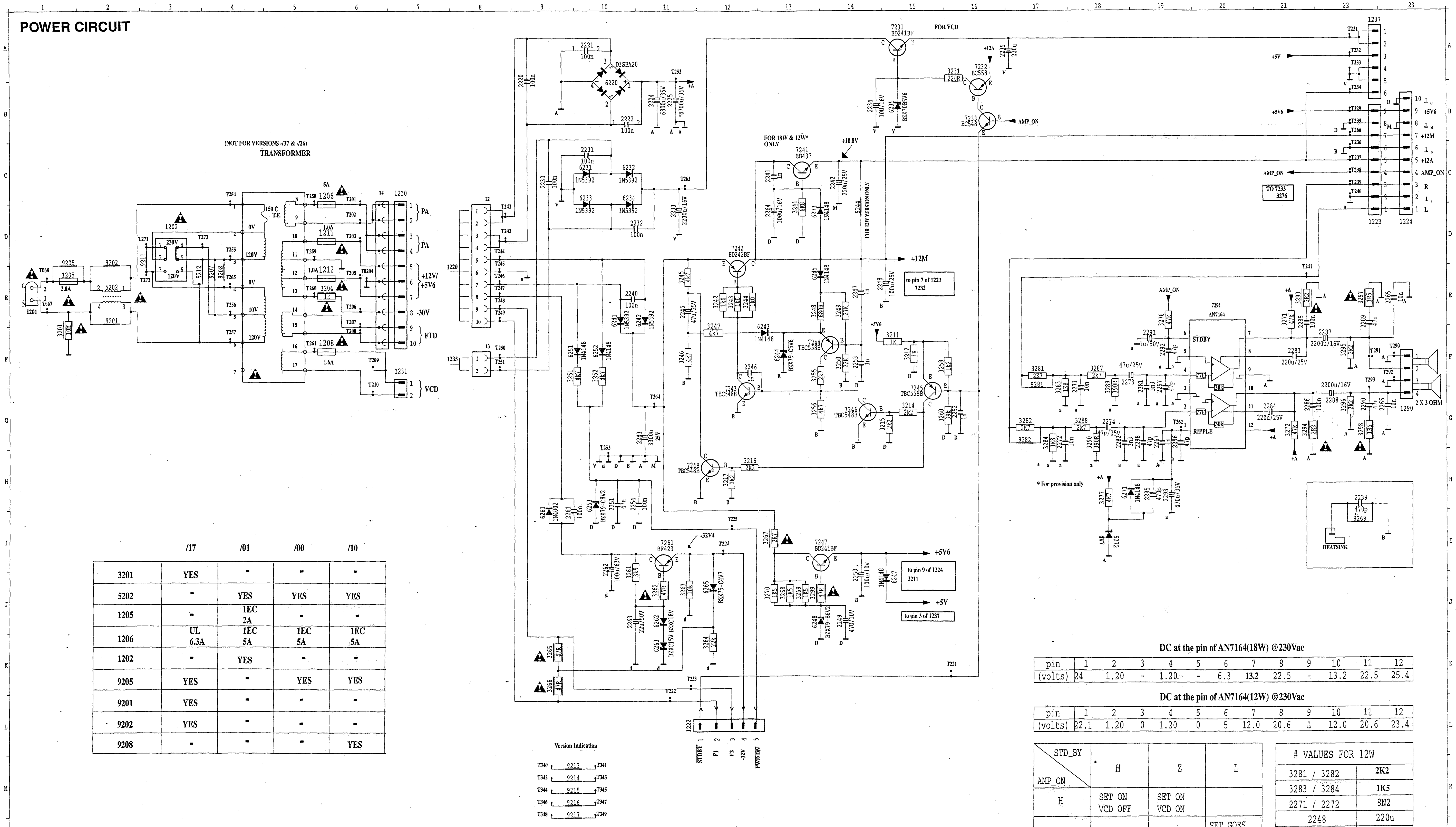
CONNECTOR 13 TO 1231 — *[OPTION]*

o	1	VCD	AC input to VCD rectifier
o	2	VCD	AC input to VCD rectifier

12 C 8	1210 C 7	1231 F 7	2221 A10	2232 D11	2241 C13	2248 E14	2254 H10	2266 G23	2281 F19	2287 F22	2293 H19	3204 E 6	3217 H12	3245 E11
1201 E 1	1211 D 6	1237 A22	2222 B10	2233 D11	2242 C14	2249 J14	2261 I 9	2267 G19	2282 G18	2288 G22	2295 H19	3211 F15	3231 A16	3246 F11
1202 D 3	1212 E 6	1290 G23	2224 B11	2234 B14	2243 G11	2250 J14	2262 I10	2271 F18	2283 F21	2289 E22	2296 G19	3212 F15	3241 D13	3247 F12
1205 E 1	1222 L11	13 F 8	2225 B11	2235 A16	2245 E11	2251 H10	2263 J10	2272 G17	2284 G21	2290 G22	2297 F19	3214 G15	3242 E12	3248 E13
1206 C 6	1223 D22	14 C 6	2230 C 9	2239 H22	2246 F12	2252 G16	2264 D13	2273 F18	2285 E21	2291 F19	2298 G19	3215 G15	3243 E12	3249 E14
1208 F 6	1224 D23	2220 A 9	2231 C10	2240 E10	2247 E14	2253 F14	2265 E23	2274 G18	2286 G21	2292 F19	3201 F 1	3216 H12	3244 E12	3250 F14

3251 F 9	3261 I10	3267 I13	3276 E19	3287 F18	3295 F22	6220 A10	6241 E10	6248 J13	6263 K11	7232 A16	7245 G15	9201 E 2	9212 E 3	9244 D14
3252 F10	3262 J11	3268 J13	3277 H18	3288 G18	3296 G22	6231 C10	6242 E11	6251 F 9	6265 J12	7233 B16	7246 G14	9202 D 2	9213 M 9	9269 I22
3255 F13	3263 J11	3269 J13	3281 F17	3289 F18	3297 E22	6232 C10	6243 F13	6252 F10	6271 H18	7241 C13	7247 I13	9205 D 1	9214 M 9	9281 F17
3256 G13	3264 K12	3270 J13	3282 G17	3290 G18	3298 G22	6233 C10	6244 F13	6253 H10	6272 I18	7242 D12	7248 H12	9207 E 4	9215 M 9	9282 G17
3258 F15	3265 K 9	3271 E21	3283 F17	3293 E21	3299 J13	6234 C10	6245 E13	6261 I 9	6273 D13	7243 G12	7261 I11	9208 E 4	9216 M 9	
3260 G15	3266 K 9	3272 G21	3284 G17	3294 G21	5202 E 2	6235 B15	6247 J15	6262 J11	7231 A15	7244 F13	7291 E20	9211 D 3	9217 M 9	

POWER CIRCUIT



(NOT FOR VERSIONS -/37 & -/26)
TRANSFORMER
150 C T.F.
230V
120V
0V
10V
PA
PA
+12V/ +5V6
-30V
FTD
VCD
1201
1202
1205
1206
1208
1210
1211
1212
1220
1231
1235
6220 D3SBA20
FOR VCD
7231 BD241BF
7232 BC558
7233 BC548
AMP_ON
FOR 18W & 12W* ONLY
+10.8V
7241 BD437
7242 BD242BF
7243 TBC548B
7244 TBC558B
7245 TBC558B
7246 TBC548B
7248 TBC548B
7247 BD241BF
7261 BF423
-32V4
FOR 12W VERSION ONLY
+12M
to pin 7 of 1223 7232
+5V6
to pin 9 of 1224 3211
+5V
to pin 3 of 1237
1222
STDBY 1
F1 2
F2 3
-32V 4
PWD DN 5
Version Indication
T340 9213 T341
T342 9214 T343
T344 9215 T345
T346 9216 T347
T348 9217 T349
7291 AN7164
STDBY
RIPPLE
* For provision only
HEATSINK
2239 470p
9269
2 X 3 OHM
1290
1237
1223
1224
TO 7233 3276
10 ⊥
9 +5V6
8 ⊥M
7 +12M
6 ⊥
5 +12A
4 AMP_ON
3 R
2 ⊥
1 L

	/17	/01	/00	/10
3201	YES	-	-	-
5202	-	YES	YES	YES
1205	-	1EC 2A	-	-
1206	UL 6.3A	1EC 5A	1EC 5A	1EC 5A
1202	-	YES	-	-
9205	YES	-	YES	YES
9201	YES	-	-	-
9202	YES	-	-	-
9208	-	-	-	YES

DC at the pin of AN7164(18W) @230Vac

pin	1	2	3	4	5	6	7	8	9	10	11	12
(volts)	24	1.20	-	1.20	-	6.3	13.2	22.5	-	13.2	22.5	25.4

DC at the pin of AN7164(12W) @230Vac

pin	1	2	3	4	5	6	7	8	9	10	11	12
(volts)	22.1	1.20	0	1.20	0	5	12.0	20.6	⊥	12.0	20.6	23.4

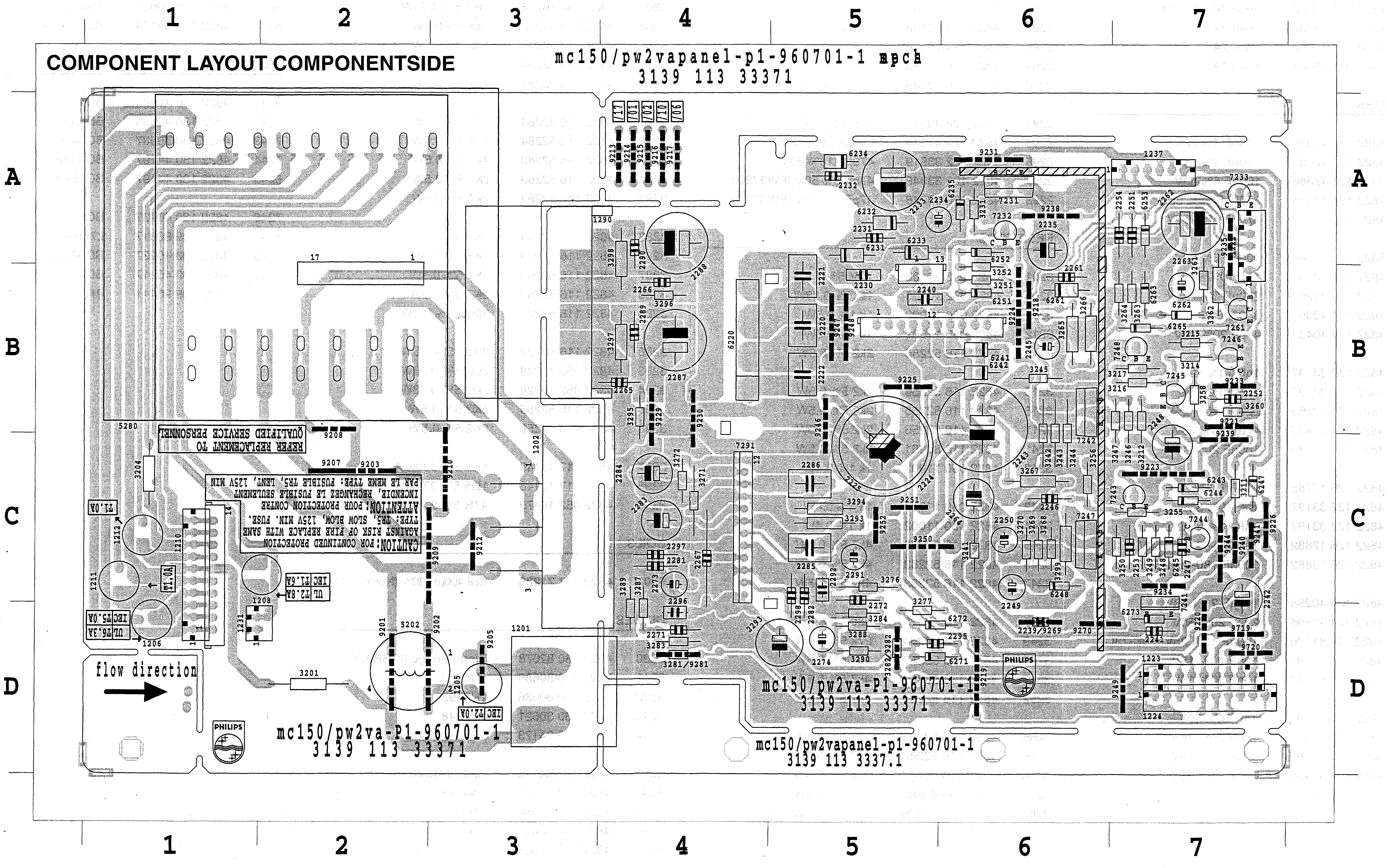
STD_BY / AMP_ON	H	Z	L
H	SET ON VCD OFF	SET ON VCD ON	
L			SET GOES STD_BY

# VALUES FOR 12W	
3281 / 3282	2K2
3283 / 3284	1K5
2271 / 2272	8N2
2248	220u
9244	YES

12 B 5	1223 D 7	2232 A 5	2248 C 7	2266 B 4	2287 B 4	3204 C 1	3245 B 6	3261 B 7	3276 C 5	3295 B 4	6235 A 6	6262 B 7	7244 C 7
13 B 5	1224 D 7	2233 A 5	2249 C 6	2267 C 4	2288 A 4	3211 C 7	3246 B 7	3262 B 7	3277 D 5	3296 B 4	6241 B 6	6263 B 7	7245 B 7
14 C 1	1231 D 1	2234 A 5	2250 C 6	2271 D 4	2289 B 4	3212 B 7	3247 B 7	3263 B 7	3281 D 4	3297 B 4	6242 B 6	6265 B 7	7246 B 7
1201 D 3	1237 A 7	2235 A 6	2251 A 7	2272 C 5	2290 A 4	3214 B 7	3248 C 7	3264 B 7	3282 D 5	3298 A 4	6243 C 7	6271 D 5	7247 C 6
1202 C 3	1290 B 3	2239 D 6	2252 B 7	2273 C 4	2291 C 5	3215 B 7	3249 C 7	3265 B 6	3283 D 4	3299 C 6	6244 C 7	6272 D 5	7248 B 7
1205 D 3	2220 B 5	2240 B 5	2253 C 7	2274 D 5	2292 C 5	3216 B 7	3250 C 7	3266 B 6	3284 D 5	5202 D 2	6245 C 7	6273 D 7	7261 B 7
1206 D 1	2221 B 5	2241 D 7	2254 A 7	2281 C 4	2293 D 5	3217 B 7	3251 B 6	3267 C 6	3287 D 4	5280 B 2	6247 C 7	7231 A 6	7291 C 4
1208 C 2	2222 B 5	2242 C 7	2261 B 6	2282 C 5	2295 D 5	3231 A 6	3252 B 6	3268 C 6	3288 D 5	6220 B 4	6248 C 6	7232 A 6	9201 D 2
1210 C 1	2224 C 5	2243 B 6	2262 A 7	2283 C 4	2296 D 4	3241 C 6	3255 C 7	3269 C 6	3289 D 4	6231 A 5	6251 B 6	7233 A 7	9202 D 2
1211 C 1	2225 C 5	2245 B 6	2263 B 7	2284 C 4	2297 C 4	3242 B 6	3256 C 6	3270 C 6	3290 D 5	6232 A 5	6252 A 6	7241 C 7	9203 C 2
1212 C 1	2230 B 5	2246 C 6	2264 C 6	2285 C 5	2298 C 5	3243 B 6	3258 B 7	3271 C 4	3293 C 5	6233 A 5	6253 A 7	7242 B 6	9205 D 3
1222 A 7	2231 A 5	2247 C 7	2265 B 4	2286 C 5	3201 D 2	3244 B 6	3260 B 7	3272 C 4	3294 C 5	6234 A 5	6261 B 6	7243 C 7	9207 C 2

9208 B 2	9221 B 7	9239 C 7	9270 D 6
9209 C 2	9223 C 7	9240 C 7	9281 D 4
9210 C 3	9224 B 6	9241 C 7	9282 D 5
9212 C 3	9225 B 5	9244 C 7	9719 D 7
9213 A 4	9226 C 7	9246 B 5	9720 D 7
9214 A 4	9229 B 4	9247 B 5	----
9215 A 4	9230 B 4	9248 B 5	
9216 A 4	9231 A 6	9249 D 7	
9217 A 4	9233 B 7	9250 C 5	
9218 B 6	9234 C 7	9251 C 5	
9219 D 6	9235 A 7	9252 C 5	
9220 D 7	9238 A 6	9269 D 6	

COMPONENT LAYOUT COMPONENTSIDE


1
2
3
4
5
6
7
A
B
C
D
mc150/pw2vapanel-p1-960701-1 mpch
3139 113 33371
REFER REPLACEMENT TO QUALIFIED SERVICE PERSONNEL
CAUTION: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE REPLACE WITH SAME TYPE: TR5, SLOW BLOW, 125V MIN. FUSE.
ATTENTION: POUR PROTECTION CONTRE INCENDIE, REMPLACEZ LE FUSIBLE SEULEMENT PAR LE MEME TYPE: FUSIBLE TR5, LENT, 125V MIN
T1.0A
T1.0A
UL T2.8A
IEC T1.6A
UL T6.3A
IEC T5.0A
IEC T2.0A
flow direction
PHILIPS
mc150/pw2va-P1-960701-1
3139 113 33371
mc150/pw2va-P1-960701-1
3139 113 33371
mc150/pw2vapanel-p1-960701-1
3139 113 3337.1
PHILIPS

POWER BOARD PARTLIST

MISCELLANEOUS

21	4822 492 63051	Spring
22	4822 492 71734	Spring
24	4822 492 11084	Spring
1201	4822 265 31015	AC Socket
1202	4822 272 10269	Voltage Selector -/21/21M
1205	4822 071 52002	Fuse 2A -/21/21M
1206	4822 071 55002	Fuse 5A
1211	4822 071 51002	Fuse 1A
1212	4822 071 51002	Fuse 1A

CAPACITORS

2220	5322 121 42386	100nF 5% 63V
2221	5322 121 42386	100nF 5% 63V
2222	5322 121 42386	100nF 5% 63V
2224	4822 124 11516	6800uF 20% 35V
2239	4822 122 33519	470pF 10% 50V
2240	5322 121 52386	100nF 5% 63V
2241	4822 122 33197	1nF 10% 50V
2242	4822 124 22263	220µF 20% 25V
2243	4822 124 42057	3300µF 20% 25V
2245	4822 124 40433	47µF 20% 25V
2246	4822 122 33197	1nF 10% 50V
2247	4822 122 33197	1nF 10% 50V
2248	4822 124 22263	220µF 20% 25V
2249	4822 124 40433	47µF 20% 25V
2250	4822 124 41584	100µF 20% 10V
2251	4822 126 12785	47nF TUB 50V
2252	4822 122 33197	1nF 10% 50V
2253	4822 122 33197	1nF 10% 50V
2254	4822 126 12882	100nF +80-20% 50V
2261	4822 126 12882	100nF +80-20% 50V
2262	4822 124 40255	100µF 20% 63V
2263	4822 124 41596	22µF 20% 50V
2264	4822 124 81136	100µF 10% 25V (FW373C)
2265	4822 121 51387	10nF 20% 16V
2266	4822 121 51387	10nF 20% 16V
2267	4822 122 33197	1nF 10% 50V
2271	4822 121 51387	10nF 20% 16V
2272	4822 121 51387	10nF 20% 16V
2273	4822 124 40433	47µF 20% 25V
2274	4822 124 40433	47µF 20% 25V

CAPACITORS

2281	4822 122 10577	3.3nF 10% 16V
2282	4822 122 10577	3.3nF 10% 16V
2283	4822 124 22263	220µF 20% 25V
2284	4822 124 22263	220µF 20% 25V
2285	5322 121 52386	100nF 5% 63V
2285	5322 121 52386	100nF 5% 63V
2287	4822 124 80148	2200µF 20% 16V
2288	4822 124 80148	2200µF 20% 16V
2289	4822 126 12785	47nF +80-20% 50V
2290	4822 126 12785	47nF +80-20% 50V
2291	4822 124 40242	1µF 20% 63V
2293	4822 124 41334	470µF 20% 63V
2295	4822 122 33519	470pF 10% 50V
2297	4822 122 33848	47pF 5% 50V (FW373C)
2298	4822 122 33848	47pF 5% 50V (FW373C)

RESISTORS

3201	4822 053 21106	10M 5% 0.5W
3204	4822 052 10108	1Ω 5% 0.33W
3211	4822 050 11002	1k 1% 0.5W
3212	4822 050 11002	1k 1% 0.5W
3214	4822 116 52256	2k2 5% 0.5W
3215	4822 116 52256	2k2 5% 0.5W
3216	4822 116 52256	2k2 5% 0.5W
3217	4822 116 52256	2k2 5% 0.5W
3241	4822 116 83961	6k8 5% 0.5W
3242	4822 050 11002	1k 1% 0.4W
3243	4822 050 11002	1k 1% 0.4W
3244	4822 050 11002	1k 1% 0.4W
3245	4822 116 52283	4k7 5% 0.5W
3246	4822 116 52283	4k7 5% 0.5W
3247	4822 116 52283	4k7 5% 0.5W
3248	4822 116 52228	680R 5% 0.5W
3249	4822 116 52264	27k 5% 0.5W
3250	4822 116 52257	22k 5% 0.5W
3251	4822 116 52283	4k7 5% 0.5W
3252	4822 116 52283	4k7 5% 0.5W
3255	4822 116 52263	2k7 5% 0.5W
3256	4822 116 52283	4k7 5% 0.5W
3258	4822 116 52207	1k2 5% 0.5W
3260	4822 116 83882	39k 5% 0.5W
3261	4822 116 52276	3k9 5% 0.5W

POWER BOARD PARTLIST

RESISTORS

3262	4822 052 10479	47Ω 5% 0.33W
3263	4822 116 83864	10k 5% 0.5W
3264	4822 116 52257	22k 5% 0.5W
3265	4822 052 10479	47Ω 5% 0.33W
3266	4822 052 10479	47Ω 5% 0.33W
3267	4822 052 10278	2R7 5% 0.33W
3268	4822 116 52243	1k5 5% 0.5W
3269	4822 116 52243	1k5 5% 0.5W
3270	4822 116 52243	1k5 5% 0.5W
3271	4822 116 52284	47k 5% 0.5W
3272	4822 116 52284	47k 5% 0.5W
3276	4822 116 52284	47k 5% 0.5W
3277	4822 116 52283	4k7 5% 0.5W
3281	4822 116 52263	2k7 5% 0.5W
3282	4822 116 52263	2k7 5% 0.5W
3283	4822 116 52249	1K8 5% 0.5W
3284	4822 116 52249	1K8 5% 0.5W
3287	4822 116 52263	2K7 5% 0.5W
3288	4822 116 52263	2K7 5% 0.5W
3289	4822 116 52222	390Ω 5% 0.5W
3290	4822 116 52222	390Ω 5% 0.5W
3293	4822 052 10228	2Ω2 5% 0.33W
3294	4822 052 10228	2Ω2 5% 0.33W
3295	4822 116 52256	2K2 5% 0.5W
3296	4822 116 52256	2K2 5% 0.5W
3297	4822 117 12148	1Ω5 5% 330mW
3298	4822 117 12148	1Ω5 5% 330mW
3299	4822 052 10479	47R 5% 0.33W

COILS

5202	4822 157 71285	Coil 400µH 30% (Not for -/37)

DIODES

6220	4822 130 82078	Diode Bridge D5SBA20
6241	5322 130 80686	1N5392
6242	5322 130 80686	1N5392
6243	4822 130 30621	1N4148
6244	4822 130 34173	BZX79-C5V6
6245	4822 130 34173	BZX79-C5V6
6247	4822 130 30621	1N4148
6248	5322 130 30684	1N4002
6251	4822 130 30621	1N4148
6252	4822 130 30621	1N4148

DIODES

6253	4822 130 34382	BZX79-C8V2
6261	5322 130 30684	1N4002
6262	4822 130 31024	BZX79-C18
6263	4822 130 34281	BZX79-C15
6265	4822 130 34174	BZX79-C4V7
6271	4822 130 30621	1N4148
6272	4822 130 34174	BZX79-C4V7

TRANSISTORS

9241	4822 130 40982	BD437
7242	4822 130 40995	BD438
7243	4822 130 40937	BC548B
7244	4822 130 44197	BC558B
8245	4822 130 44197	BC558B
7246	4822 130 40937	BC548B
8247	4822 209 80817	L7805CV
7248	4822 130 40937	BC548B
7261	4822 130 40917	BD238
7291	4822 209 90411	AN7164

AF3 BOARD

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Circuit Diagram 12-2
Component layout 12-3
Chip component layout 12-4
Electrical parts list... 12-5

BRIEF INTRODUCTION OF AF3 BOARD

The AF3 Board consists of the following:

a. SOFAC IC which includes functions such as source selection, loudness control, dynamic bass control, treble control, front/ rear volume control and muting function. Sound features such as DBB, DSC, and IS are controllable via I^{2}C data from the microprocessor.
   The SOFAC IC caters for 4 input sources namely Tuner, Tape, CD and AUX.

b. Karaoke Mic Mixing
   NK: Non-Karaoke
   SK: Simple Karaoke which caters for mic. mixing with additional mic. amplifier board.
   FK: Full Karaoke with vocal fader and echo effect with additional Karaoke Board.

c. Dolby Pro-Logic interface
   It caters for DPL and also DPL with one of the Karaoke functions.

d. Line out provision

e. Sub-woofer output with cinch socket for connection to active sub-woofer speaker.

f. Incredible Surround effect using transistor circuit to create phase shifting and spatial effect.

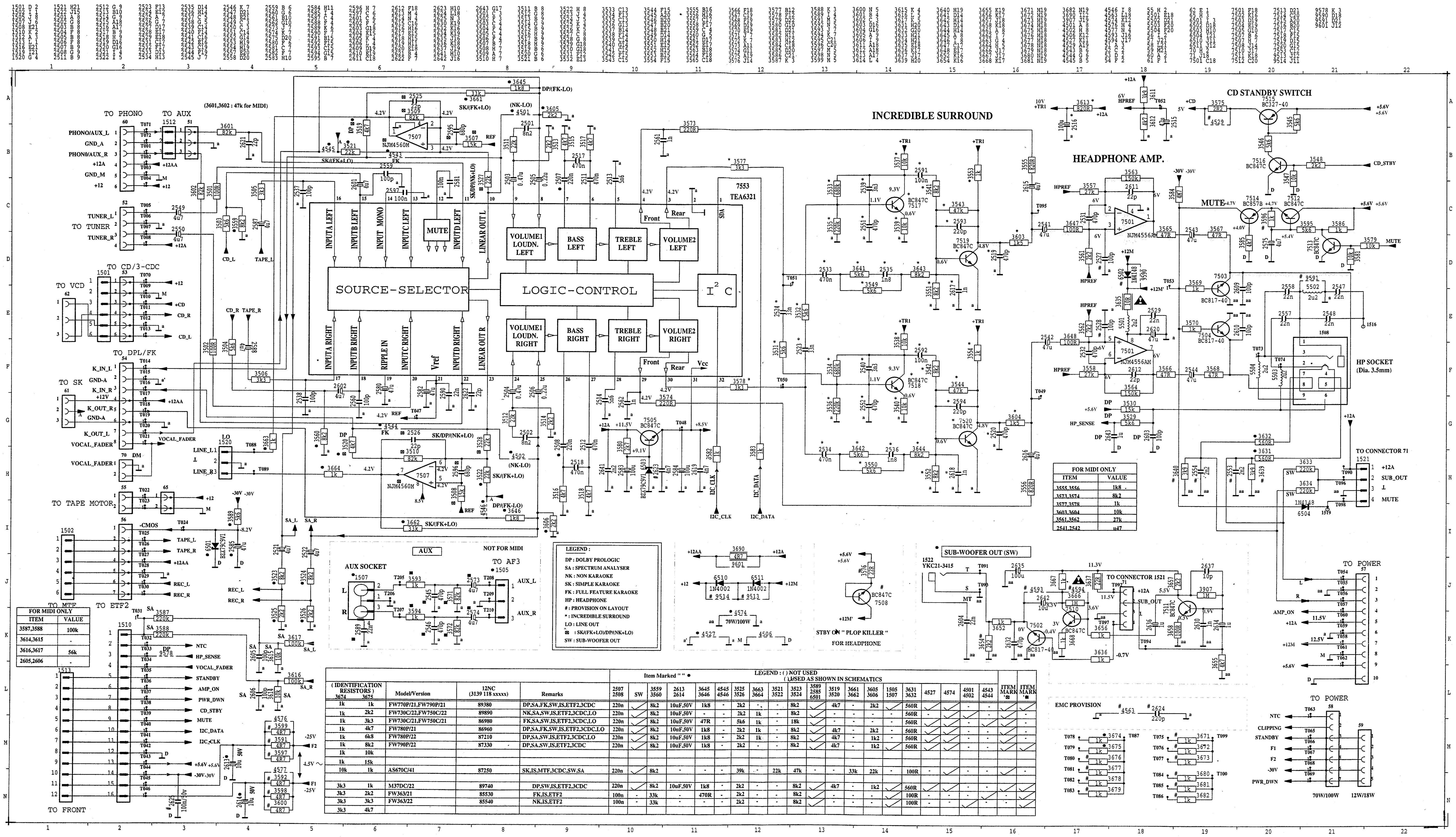
g. Headphone amplifier using Op-Amp. NJM4456M

h. CD Standby control circuit which switches on the supply to CD Servo control IC, HF circuit and the laser light pen in CD mode only.

i. Headphone Sensing circuit to mute centre and surround channels in DPL application.

j. Attenuation network is provided at the output of the AF3 Board for interfacing with power board of different output power.

AF3 CIRCUIT


TO PHONO
TO AUX
(3601,3602 : 47k for MIDI)
PHONO/AUX_L
GND_A
PHONO/AUX_R
GND_M
TO TUNER
TUNER_L
TUNER_R
TO CD/3-CDC
TO VCD
TO DPL/FK
TO SK
K_IN_L
K_IN_R
K_OUT_L
K_OUT_R
VOCAL_FADER
TO TAPE MOTOR
TO MTF
TO ETF2
TO FRONT
NTC
HP_SENSE
STANDBY
AMP_ON
PWR_DWN
CD_STBY
MUTE
I2C_DATA
I2C_CLK
SOURCE-SELECTOR
LOGIC-CONTROL
I2C
INPUTA LEFT
INPUTB LEFT
INPUT MONO
INPUTC LEFT
MUTE
INPUTD LEFT
LINEAR OUT L
VOLUME1 LOUDN. LEFT
BASS LEFT
TREBLE LEFT
VOLUME2 LEFT
VOLUME1 LOUDN. RIGHT
BASS RIGHT
TREBLE RIGHT
VOLUME2 RIGHT
INPUTA RIGHT
INPUTB RIGHT
RIPPLE IN
INPUTC RIGHT
Vref
INPUTD RIGHT
LINEAR OUT R
Front
Rear
7553 TEA6321
NJM4560M
INCREDIBLE SURROUND
HEADPHONE AMP.
CD STANDBY SWITCH
HP SOCKET (Dia. 3.5mm)
TO CONNECTOR 71
SUB_OUT
SUB-WOOFER OUT (SW)
TO CONNECTOR 1521
TO POWER
70W/100W
12W/18W
AUX SOCKET
AUX
NOT FOR MIDI
TO AF3
STBY ON " PLOP KILLER " FOR HEADPHONE
EMC PROVISION
LEGEND :
DP : DOLBY PROLOGIC
SA : SPECTRUM ANALYSER
NK : NON KARAOKE
SK : SIMPLE KARAOKE
FK : FULL FEATURE KARAOKE
HP : HEADPHONE
# : PROVISION ON LAYOUT
* : INCREDIBLE SURROUND
LO : LINE OUT
⊠ : SK/(FK+LO)/DP/(NK+LO)
SW : SUB-WOOFER OUT

FOR MIDI ONLY	
ITEM	VALUE
3587,3588	100k
3614,3615	-
3616,3617	56k
2605,2606	-

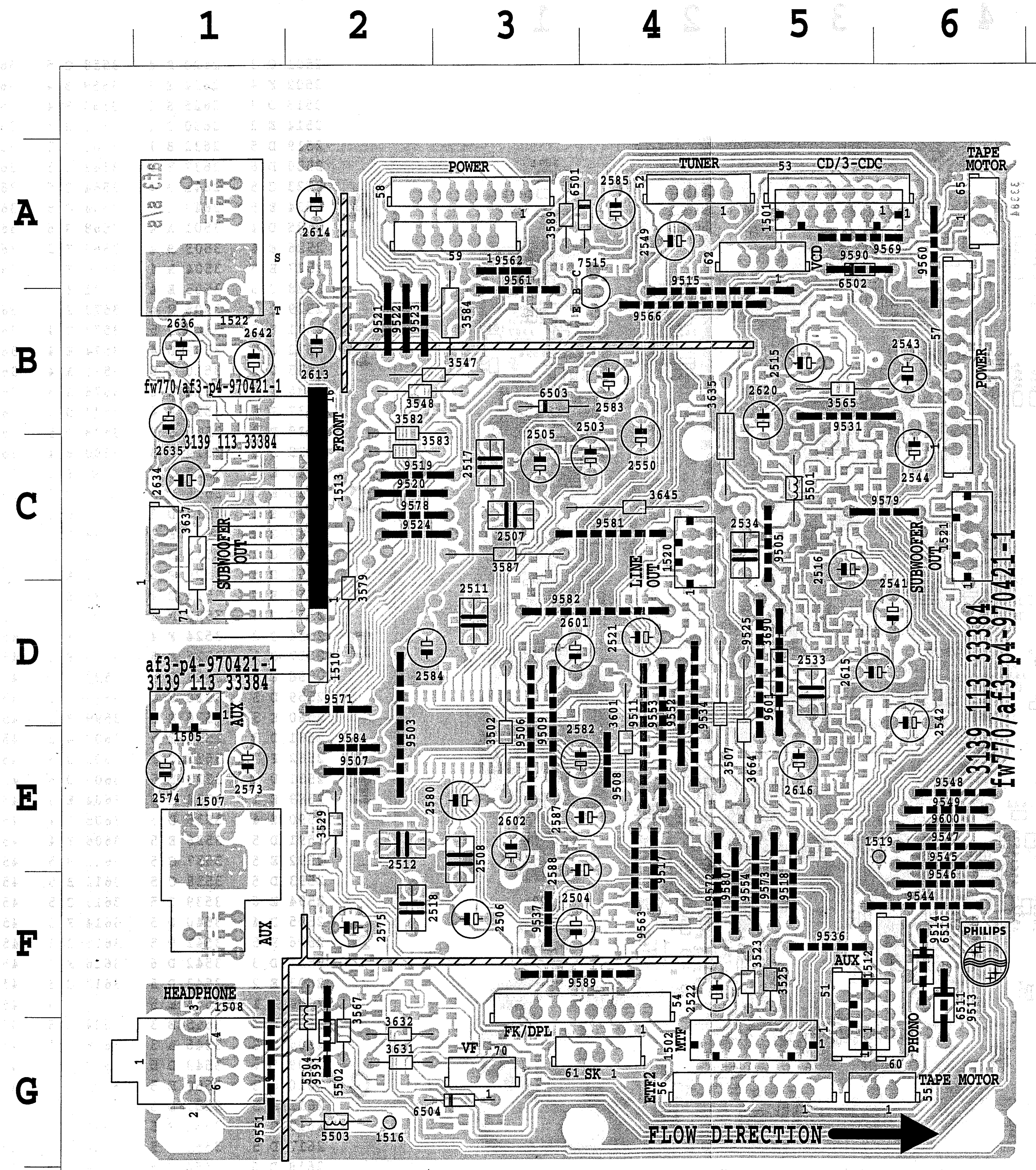
FOR MIDI ONLY	
ITEM	VALUE
3555,3556	1k8
3573,3574	8k2
3577,3578	1k
3603,3604	10k
3561,3562	27k
2541,2542	u47

Item Marked " " ●

LEGEND : ( ) NOT USED
(✓) USED AS SHOWN IN SCHEMATICS

(IDENTIFICATION RESISTORS) 3674	3675	Model/Version	12NC (3139 118 xxxxx)	Remarks	2507 2508	SW	3559 3560	2613 2614	3645 3646	4545 4546	3525 3526	3663 3664	3521 3522	3523 3524	3589 2585 6501	3519 3520	3661 3662	3605 3606	1505 1507	3631 3632	4527	4574	4501 4502	4543 4544	ITEM MARK '⊠'	ITEM MARK '■'
1k	1k	FW770P/21,FW790P/21	89380	DP,SA,FK,SW,IS,ETF2,3CDC	220n	✓	8k2	10uF,50V	1k8	-	2k2	-	-	8k2	✓	4k7	-	2k2	✓	560R	✓	✓	-	-	✓	✓
1k	2k2	FW730C/22,FW750C/22	89890	NK,SA,SW,IS,ETF2,3CDC,LO	220n	✓	8k2	10uF,50V	-	-	2k2	1k	-	8k2	✓	-	-	-	-	560R	-	✓	✓	-	✓	-
1k	3k3	FW730C/21,FW750C/21	86980	FK,SA,SW,IS,ETF2,3CDC,LO	220n	✓	8k2	10uF,50V	47R	-	5k6	1k	-	18k	✓	-	-	-	-	560R	✓	✓	-	✓	✓	-
1k	4k7	FW780P/21	86960	DP,SA,FK,SW,IS,ETF2,3CDC,LO	220n	✓	8k2	10uF,50V	1k8	-	2k2	1k	-	8k2	✓	4k7	-	2k2	-	560R	✓	✓	-	-	✓	-
1k	6k8	FW780P/22	87210	DP,SA,SW,IS,ETF2,3CDC,LO	220n	✓	8k2	10uF,50V	1k8	-	2k2	1k	-	8k2	✓	4k7	-	1k2	-	560R	✓	✓	-	-	✓	-
1k	8k2	FW790P/22	87330	DP,SA,SW,IS,ETF2,3CDC	220n	✓	8k2	10uF,50V	1k8	-	2k2	-	-	8k2	✓	4k7	-	1k2	✓	560R	✓	✓	-	-	✓	✓
1k	10k																									
1k	15k																									
10k	1k	AS670C/41	87250	SK,IS,MTF,3CDC,SW,SA	220n	✓	8k2	-	-	-	39k	-	22k	47k	-	-	33k	22k	-	100R	-	✓	-	-	✓	-
3k3	1k	M37DC/22	89740	DP,SW,IS,ETF2,3CDC	220n	✓	8k2	10uF,50V	1k8	-	2k2	-	-	8k2	✓	4k7	-	1k2	✓	560R	✓	✓	-	-	✓	✓
3k3	2k2	FW363/21	85530	FK,IS,ETF2	100n	-	33k	-	470R	-	2k2	-	-	8k2	✓	-	-	-	✓	100R	-	-	-	✓	-	✓
3k3	3k3	FW363/22	85540	NK,IS,ETF2	100n	-	33k	-	-	-	2k2	-	-	8k2	✓	-	-	-	✓	100R	-	-	✓	-	-	✓
3k3	4k7																									

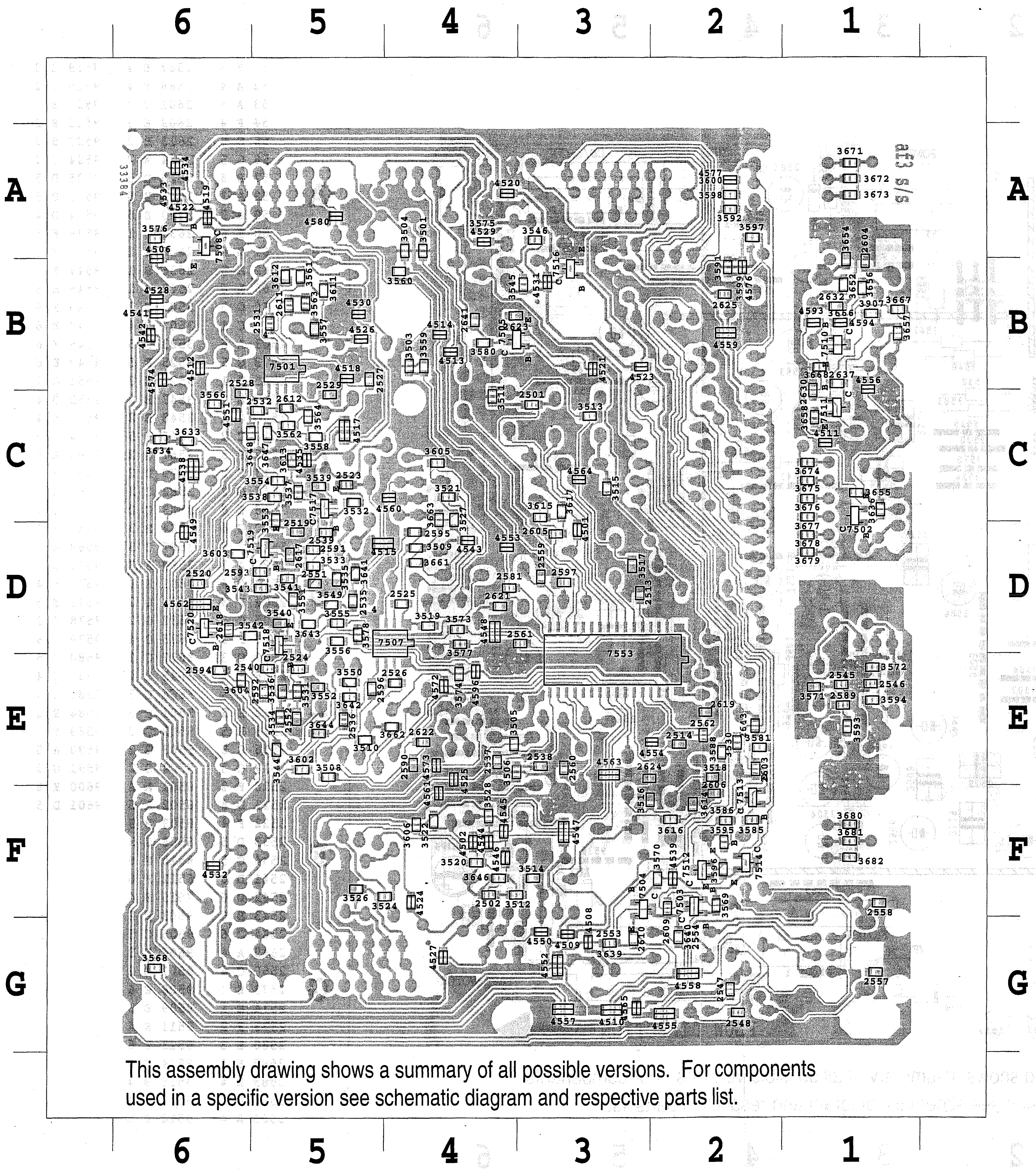
COMPONENT LAYOUT


1
2
3
4
5
6
A
B
C
D
E
F
G
POWER
TUNER
CD/3-CDC
TAPE MOTOR
VCD
FRONT
SUBWOOFER OUT
LINE OUT
AUX
HEADPHONE
FK/DPL
VF
SK
MTF
ETF2
PHONO
PHILIPS
FLOW DIRECTION
fw770/af3-p4-970421-1
3139 113 33384
af3-p4-970421-1

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

51	F	5	2587	E	4	9519	C	2
52	A	4	2588	F	4	9520	C	2
53	A	5	2601	D	3	9521	B	2
54	F	4	2602	E	3	9522	B	2
55	G	6	2613	B	2	9523	B	2
56	G	5	2614	A	2	9524	C	2
57	B	6	2615	D	6	9525	D	5
58	A	3	2616	E	5	9531	B	5
59	A	3	2620	B	5	9534	D	4
60	F	6	2634	C	1	9536	F	5
61	G	4	2635	B	1	9537	F	3
62	A	5	2636	B	1	9544	F	6
65	A	6	2642	B	1	9545	E	6
70	G	3	3502	E	3	9546	F	6
71	C	1	3507	D	4	9547	E	6
1501	A	5	3523	F	5	9548	E	6
1502	G	5	3525	F	5	9549	E	6
1505	D	1	3529	E	2	9551	G	1
1507	E	1	3547	B	2	9552	D	4
1508	G	1	3548	B	2	9553	E	4
1510	C	2	3565	B	5	9554	F	5
1512	F	5	3567	G	2	9560	A	6
1513	C	2	3579	D	2	9561	B	3
1516	G	2	3582	C	2	9562	A	3
1518	E	6	3583	C	2	9563	E	4
1520	C	4	3584	B	3	9566	B	4
1521	C	6	3587	C	3	9569	A	5
1522	A	1	3589	A	3	9571	D	2
2503	C	4	3601	E	4	9572	F	4
2504	F	3	3631	G	2	9573	F	5
2505	C	3	3632	G	2	9578	C	2
2506	F	3	3635	C	4	9579	C	6
2507	C	3	3637	C	1	9580	F	5
2508	E	3	3645	C	4	9581	C	4
2511	D	3	3664	E	5	9582	D	4
2512	E	2	5501	C	5	9584	E	2
2515	B	5	5502	G	2	9589	F	3
2516	C	5	5503	G	2	9590	A	5
2517	C	3	5504	G	2	9591	G	2
2518	F	2	6501	A	4	9600	E	6
2521	D	4	6502	A	5	9601	D	5
2522	F	4	6503	B	3			
2533	D	5	6504	G	3			
2534	C	5	6510	F	6			
2541	D	6	6511	F	6			
2542	D	6	7515	B	4			
2543	B	6	9503	E	2			
2544	C	6	9505	C	5			
2549	A	4	9506	E	3			
2550	C	4	9507	E	2			
2573	E	1	9508	E	4			
2574	E	1	9509	E	3			
2575	F	2	9511	E	4			
2580	E	3	9513	F	6			
2582	E	3	9514	F	6			
2583	B	4	9515	B	4			
2584	D	2	9517	F	4			
2585	A	4	9518	F	5			

CHIP LAYOUT



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

2501	C	3	2623	B	4	3558	C	5	3652	B	1
2502	F	4	2624	E	3	3559	B	4	3654	B	1
2513	D	3	2625	B	2	3560	B	4	3655	C	1
2514	E	2	2630	C	1	3561	B	5	3656	B	1
2519	D	5	2632	B	1	3562	C	5	3657	B	1
2520	D	6	2637	B	1	3563	B	5	3658	C	1
2523	C	5	2641	B	4	3564	C	5	3661	D	4
2524	E	5	2643	E	2	3566	C	6	3662	E	4
2525	D	4	3501	A	4	3568	G	6	3663	C	4
2526	E	4	3503	B	4	3569	F	2	3666	B	1
2527	B	5	3504	A	4	3570	F	2	3667	B	1
2528	C	6	3505	E	4	3571	E	1	3668	B	1
2529	C	5	3506	E	4	3572	E	1	3671	A	1
2531	B	5	3508	E	5	3573	D	4	3672	A	1
2532	C	5	3509	D	4	3574	E	4	3673	A	1
2535	D	5	3510	E	5	3575	A	4	3674	C	1
2536	E	5	3511	C	4	3576	A	6	3675	C	1
2537	E	4	3512	F	4	3577	D	4	3676	C	1
2538	E	3	3513	C	3	3578	D	5	3677	C	1
2539	D	5	3514	F	3	3580	B	4	3678	D	1
2540	E	5	3515	C	3	3581	E	2	3679	D	1
2545	E	1	3516	F	3	3585	F	2	3680	F	1
2546	E	1	3517	D	3	3586	F	2	3681	F	1
2547	G	2	3518	E	2	3588	E	2	3682	F	1
2548	G	2	3519	D	4	3591	B	2	3907	B	1
2551	D	5	3520	F	4	3592	A	2	4501	D	3
2552	E	5	3521	C	4	3593	E	1	4502	F	4
2553	G	3	3522	F	4	3594	E	1	4506	B	6
2554	G	2	3524	F	4	3595	F	2	4508	G	3
2557	G	1	3526	F	5	3596	F	2	4509	G	3
2558	F	1	3527	C	4	3597	A	2	4510	G	3
2559	D	3	3528	F	4	3598	A	2	4511	C	1
2560	E	3	3530	E	2	3599	B	2	4512	B	6
2561	D	3	3531	E	5	3600	A	2	4513	B	4
2562	E	2	3532	C	5	3602	E	5	4514	B	4
2581	D	4	3533	D	5	3603	D	6	4515	D	5
2589	E	1	3534	E	5	3604	E	6	4517	C	5
2590	E	4	3535	D	5	3605	C	4	4518	B	5
2591	D	5	3536	E	5	3606	F	4	4519	A	6
2592	E	5	3537	C	5	3611	B	5	4520	A	4
2593	D	5	3538	C	5	3612	B	5	4521	B	3
2594	E	6	3539	C	5	3613	C	5	4522	A	6
2595	D	4	3540	D	5	3614	F	2	4523	B	3
2596	E	5	3541	D	5	3615	C	3	4524	F	4
2597	D	3	3542	D	6	3616	F	2	4525	E	4
2603	E	2	3543	D	5	3617	C	3	4526	B	5
2604	B	1	3544	E	5	3633	C	6	4527	G	4
2605	D	3	3545	B	3	3634	C	6	4528	B	6
2606	F	2	3546	A	3	3636	C	1	4529	A	4
2609	F	2	3549	D	5	3639	G	3	4530	B	5
2610	G	3	3550	E	5	3640	G	2	4531	B	3
2611	B	5	3551	D	5	3641	D	5	4532	F	6
2612	C	5	3552	E	5	3642	E	5	4533	A	6
2617	D	5	3553	C	5	3643	D	5	4534	A	6
2618	D	6	3554	C	5	3644	E	5	4535	C	5
2619	E	2	3555	D	5	3646	F	4	4538	C	6
2621	D	4	3556	D	5	3647	C	5	4539	F	2
2622	E	4	3557	B	5	3648	C	6	4541	B	6

ELECTRICAL PARTSLIST AF3 BOARD

MISCELLANEOUS

1507	4822 265 20553	Aux Connector
1508	4822 267 40898	Headphone

CAPACITORS

2501	4822 122 33336	8.2nF 10% 50V
2502	4822 122 33336	8.2nF 10% 50V
2503	4822 124 41407	0.47µF 20% 63V
2504	4822 124 41407	0.47µF 20% 63V
2505	4822 124 40746	0.22µF 20% 63V
2506	4822 124 40746	0.22µF 20% 63V
2507	5322 121 42386	100nF 5% 63V
2508	5322 121 42386	100nF 5% 63V
2511	4822 121 51252	470nF 5% 63V
2512	4822 121 51252	470nF 5% 63V
2513	4822 122 32646	5.6nF 10% 50V
2514	4822 122 32646	5.6nF 10% 50V
2515	4822 124 41751	47µF 20% 50V
2516	4822 124 81029	100µF 20% 25V
2517	4822 121 51252	470nF 5% 63V
2518	4822 121 51252	470nF 5% 63V
2519	5322 122 32268	470pF 10% 50V
2520	5322 122 32268	470pF 10% 50V
2521	4822 124 41751	47µF 20% 50V
2522	4822 124 41751	47µF 20% 50V
2523	4822 122 33177	10nF 20% 50V
2524	4822 122 33177	10nF 20% 50V
2527	5322 122 32531	100pF 5% 50V
2528	5322 122 32531	100pF 5% 50V
2529	5322 122 32654	22nF 10% 63V
2531	5322 122 32268	470pF 10% 50V
2532	5322 122 32268	470pF 10% 50V
2533	4822 121 51252	470nF 5% 63V
2534	4822 121 51252	470nF 5% 63V
2535	4822 122 33219	1.8nF 10% 50V
2536	4822 122 33219	1.8nF 10% 50V
2537	5322 122 32531	100pF 5% 50V
2538	5322 122 32531	100pF 5% 50V
2539	4822 122 33891	3.3nF 10% 63V
2540	4822 122 33891	3.3nF 10% 63V
2541	4822 124 41751	47µF 20% 50V
2542	4822 124 41751	47µF 20% 50V
2543	4822 124 41751	47µF 20% 50V
2544	4822 124 41751	47µF 20% 50V
2545	5322 122 32268	470pF 10% 50V

CAPACITORS

2546	5322 122 32268	470pF 10% 50V
2547	5322 122 32654	22nF 10% 63V
2549	4822 124 40246	4.7µF 20% 50V
2550	4822 124 40246	4.7µF 20% 50V
2551	5322 122 32268	470pF 10% 50V
2552	5322 122 32268	470pF 10% 50V
2557	5322 122 32654	22nF 10% 63V
2558	5322 122 32654	22nF 10% 63V
2559	5322 122 32531	100pF 5% 50V
2560	5322 122 32531	100pF 5% 50V
2561	5322 122 34123	1nF 10% 50V
2562	5322 122 34123	1nF 10% 50V
2573	4822 124 40246	4.7µF 20% 50V
2574	4822 124 40246	4.7µF 20% 50V
2575	4822 124 40246	4.7µF 20% 50V
2580	4822 124 41751	47µF 20% 50V
2581	4822 122 33177	10nF 20% 50V
2582	4822 124 41751	47µF 20% 50V
2583	4822 124 81029	100µF 20% 25V
2584	4822 124 81029	100µF 20% 25V
2585	4822 124 41751	47µF 20% 50V
2587	4822 124 40246	4.7µF 20% 50V
2588	4822 124 40246	4.7µF 20% 50V
2589	4822 126 13838	100nF +80%/-20% 50V
2590	5322 122 32658	22pF 5% 50V
2591	4822 126 13838	100nF +80%/-20% 50V
2592	4822 126 13838	100nF +80%/-20% 50V
2593	4822 122 33575	220pF 5% 50V
2594	4822 122 33575	220pF 5% 50V
2597	4822 126 13838	100nF +80%/-20% 50V
2601	4822 124 40246	4.7µF 20% 50V
2602	4822 124 40246	4.7µF 20% 50V
2603	5322 122 32531	100pF 5% 50V
2609	5322 122 32531	100pF 5% 50V
2610	5322 122 32531	100pF 5% 50V
2611	5322 122 32658	22pF 5% 50V
2612	5322 122 32658	22pF 5% 50V
2615	4822 124 40246	4.7µF 20% 50V
2616	4822 124 40246	4.7µF 20% 50V
2617	5322 122 34123	1nF 10% 50V

ELECTRICAL PARTSLIST AF3 BOARD

CAPACITORS

2618	5322 122 34123	1nF 10% 50V
2620	4822 124 40433	47µF 20% 25V
2621	5322 122 32658	22pF 5% 50V
2622	5322 122 32658	22pF 5% 50V
2623	5322 126 10223	4.7nF 10% 63V
2624	5322 126 10794	220pF 5% 63V
2641	4822 122 33175	22nF 20% 50V

RESISTORS

3501	4822 051 20101	100R 1% 0.1W
3502	4822 116 52175	100R 1% 0.5W
3503	4822 051 20562	5k6 5% 0.1W
3504	4822 051 20562	5k6 5% 0.1W
3505	4822 051 20332	3k3 5% 0.1W
3506	4822 051 20332	3k3 5% 0.1W
3511	4822 051 20223	22k 5% 0.1W
3512	4822 051 20223	22k 5% 0.1W
3513	4822 051 20222	2k2 5% 0.1W
3514	4822 051 20222	2k2 5% 0.1W
3515	4822 051 20472	4k7 5% 0.1W
3516	4822 051 20472	4k7 5% 0.1W
3517	4822 051 20472	4k7 5% 0.1W
3518	4822 051 20472	4k7 5% 0.1W
3523	4822 116 52303	8k2 5% 0.5W
3524	4822 116 52303	8k2 5% 0.1W
3527	4822 116 52256	2k2 5% 0.5W
3528	4822 117 11449	2k2 1% 0.5W
3531	4822 051 20562	5k6 5% 0.1W
3532	4822 051 20562	5k6 5% 0.1W
3533	4822 051 20684	680k 5% 0.1W
3534	4822 051 20684	680k 5% 0.1W
3535	4822 051 20224	220k 5% 0.5W
3536	4822 051 20224	220k 5% 0.5W
3537	4822 117 10833	10k 5% 0.1W
3538	4822 117 10833	10k 5% 0.1W
3539	4822 117 10833	10k 5% 0.1W
3540	4822 117 10833	10k 5% 0.1W
3541	4822 051 20822	8k2 5% 0.1W
3542	4822 051 20822	8k2 5% 0.1W
3543	4822 051 20473	47k 5% 0.1W
3544	4822 051 20473	47k 5% 0.1W
3545	4822 051 20562	5k6 5% 0.1W
3546	4822 051 20562	5k6 5% 0.1W
3547	4822 116 83864	10k 5% 0.5W

RESISTORS

3548	4822 116 52256	2k2 5% 0.5W
3549	4822 051 20562	5k6 5% 0.1W
3550	4822 051 20562	5k6 5% 0.1W
3551	4822 051 20822	8k2 5% 0.1W
3552	4822 051 20822	8k2 5% 0.1W
3553	4822 051 10102	1k 2% 0.25W
3554	4822 051 10102	1k 2% 0.25W
3555	4822 051 20821	820R 5% 0.1W
3556	4822 051 20821	820R 5% 0.1W
3557	4822 051 20273	27k 5% 0.1W
3558	4822 051 20273	27k 5% 0.1W
3559	4822 051 20822	8k2 5% 0.1W
3559	4822 051 20333	33k 5% 0.1W (FW373C)
3560	4822 051 20822	8k2 5% 0.1W
3560	4822 051 20333	33k 5% 0.1W (FW373C)
3561	4822 051 20273	27k 5% 0.1W
3562	4822 117 11449	2k2 5% 0.1W
3563	4822 051 20154	150k 5% 0.1W
3564	4822 051 20154	150k 5% 0.1W
3565	4822 116 52195	47Ω 5% 0.5W
3566	4822 051 20479	47Ω 5% 0.1W
3567	4822 051 20479	47Ω 5% 0.1W
3568	4822 051 20479	47Ω 5% 0.1W
3569	4822 051 10102	1k 2% 0.25W
3570	4822 051 10102	1k 2% 0.25W
3571	4822 117 11149	82k 5% 0.1W
3572	4822 117 11149	82k 5% 0.1W
3573	4822 051 20221	220R 5% 0.1W
3574	4822 051 20221	220R 5% 0.1W
3575	4822 051 20228	2Ω2 5% 0.1W
3577	4822 051 10332	3k3 2% 0.25W
3578	4822 051 10332	3k3 2% 0.25W
3579	4822 116 83864	10k 5% 0.1W
3580	4822 117 11139	1k5 5% 0.1W
3581	4822 116 83864	10k 5% 0.5W
3582	4822 050 11002	1k 1% 0.4W
3583	4822 050 11002	1k 1% 0.4W
3584	4822 050 24705	4M7 1% 0.6W
3585	4822 051 20472	4k7 5% 0.1W
3586	4822 051 10102	1k 2% 0.25W

ELECTRICAL PARTSLIST AF2 BOARD

RESISTORS

3589	4822 116 52244	15k 5% 0.5W
3593	4822 051 10102	1k 2% 0.25W
3594	4822 051 10102	1k 2% 0.25W
3595	4822 051 20562	5k6 5% 0.1W
3601	4822 116 52297	68k 5% 0.1W
3602	4822 226 52297	68k 5% 0.1W
3603	4822 117 11139	1k5 5% 0.1W
3604	4822 117 11139	1k5 5% 0.1W
3611	4822 051 20392	3k9 5% 0.1W
3612	4822 051 20472	4k7 5% 0.1W
3613	4822 051 20821	820R 5% 0.1W
3631	4822 051 20101	100Ω 5% 0.1W
3632	4822 051 20101	100Ω 5% 0.1W
3633	4822 051 20224	220k 5% 0.1W
3634	4822 051 20224	220k 5% 0.1W
3635	4822 052 10109	10Ω 5% 0.33W
3641	4822 051 20562	5k6 5% 0.1W
3643	4822 051 20822	8k2 5% 0.1W
3644	4822 051 20822	8k2 5% 0.1W
3645	4822 116 83883	470R 5% 0.5W (FW373C)
3646	4822 116 83883	470R 5% 0.5W (FW373C)

CHIP JUMPER

4501	4822 051 20008	0Ω Jumper (Not for -/21)
4503	4822 051 20008	0Ω Jumper
4504	4822 051 20008	0Ω Jumper
4505	4822 051 20008	0Ω Jumper
4506	4822 051 20008	0Ω Jumper
4507	4822 051 20008	0Ω Jumper
4508	4822 051 20008	0Ω Jumper
4509	4822 051 20008	0Ω Jumper
4510	4822 051 20008	0Ω Jumper
4512	4822 051 20008	0Ω Jumper
4513	4822 051 20008	0Ω Jumper
4514	4822 051 20008	0Ω Jumper
4515	4822 051 20008	0Ω Jumper
4518	4822 051 20008	0Ω Jumper
4517	4822 051 20008	0Ω Jumper
4519	4822 051 20008	0Ω Jumper
4520	4822 051 20008	0Ω Jumper
4522	4822 051 20008	0Ω Jumper
4523	4822 051 20008	0Ω Jumper
4524	4822 051 20008	0Ω Jumper
4525	4822 051 20008	0Ω Jumper
4526	4822 051 20008	0Ω Jumper
4528	4822 051 20008	0Ω Jumper
4529	4822 051 20008	0Ω Jumper
4531	4822 051 20008	0Ω Jumper
4532	4822 051 20008	0Ω Jumper
4533	4822 051 20008	0Ω Jumper
4534	4822 051 20008	0Ω Jumper
4535	4822 051 20008	0Ω Jumper
4545	4822 051 20008	0Ω Jumper
4546	4822 051 20008	0Ω Jumper
4551	4822 051 20008	0Ω Jumper
4572	4822 051 20008	0Ω Jumper
4573	4822 051 20008	0Ω Jumper
4574	4822 051 20008	0Ω Jumper
4575	4822 051 20008	0Ω Jumper
4576	4822 051 20008	0Ω Jumper
4577	4822 051 20008	0Ω Jumper
4580	4822 051 20008	0Ω Jumper

ELECTRICAL PARTSLIST AF2 BOARD

DIODES

6501	4822 130 34382	BZX79-C8V2

INTERGRATED CIRCUITS

7501	4822 209 31378	NJM4556AM
7506	4822 209 63709	LM324D
7507	4822 209 83357	NJM4560M (-/21)
7553	4822 209 33652	TEA6321T/V1

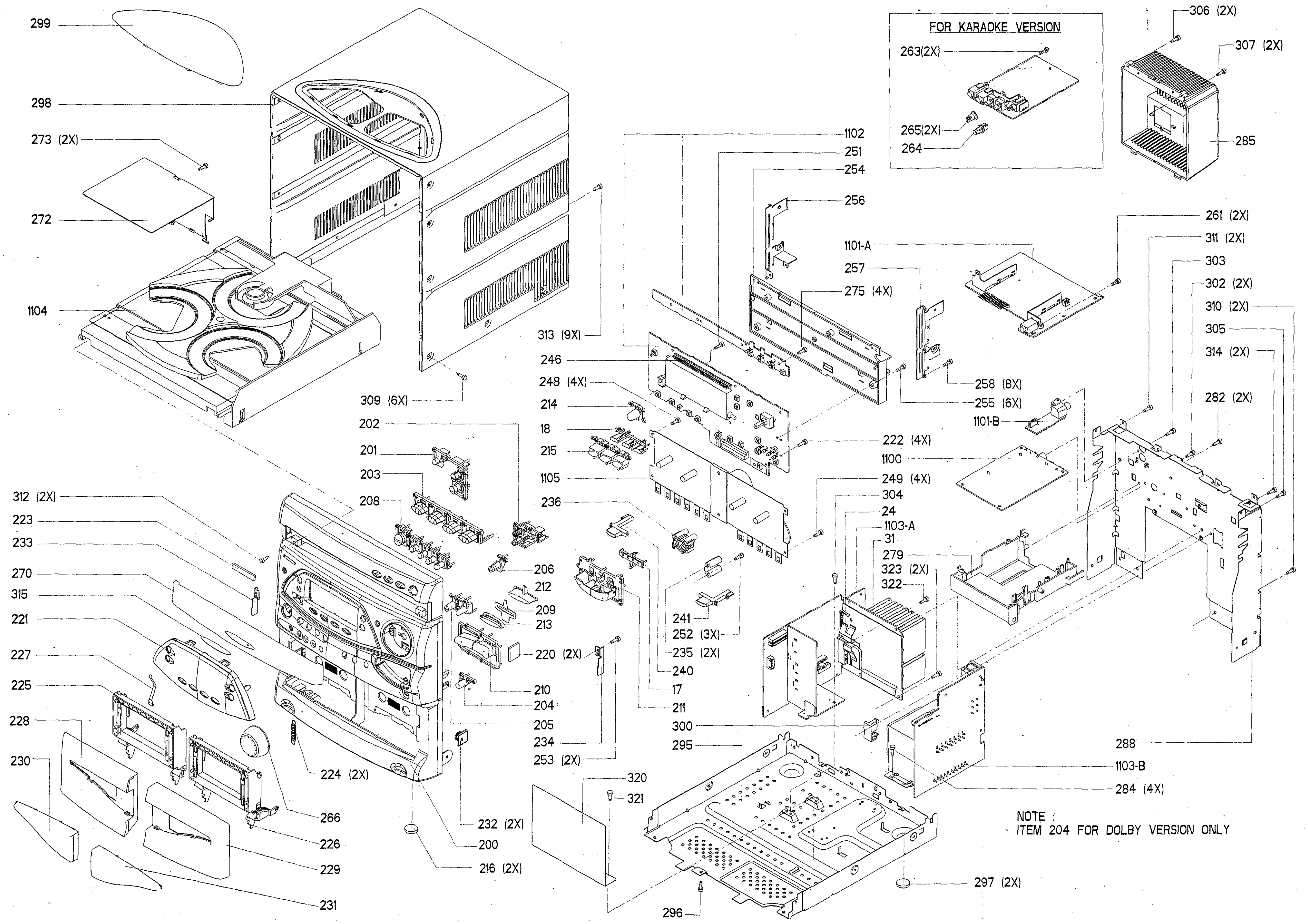
TRANSISTORS

7503	4822 130 42615	BC817-40
7504	4822 130 42615	BC817-40
7505	5322 130 42136	BC848C
7508	5322 130 42136	BC848C
7512	5322 130 42136	BC848C
7513	5322 130 42136	BC848C
7514	5322 130 41983	BC858B
7515	4822 130 41327	BC327-40
7516	5322 130 42136	BC848C

COILS

5501	4822 156 21721	COIL 2.2µH
5502	4822 156 21721	COIL 2.2µH
5503	4822 156 21721	COIL 2.2µH
5504	4822 156 21721	COIL 2.2µH

EXPLODED VIEW OF SET


FOR KARAOKE VERSION
263(2X)
265(2X)
264
306 (2X)
307 (2X)
285
299
298
273 (2X)
272
1104
313 (9X)
309 (6X)
1102
251
254
256
1101-A
257
275 (4X)
246
248 (4X)
214
18
215
1105
236
258 (8X)
255 (6X)
1101-B
222 (4X)
1100
249 (4X)
304
24
1103-A
31
279
323 (2X)
322
261 (2X)
311 (2X)
303
302 (2X)
310 (2X)
305
314 (2X)
282 (2X)
202
201
203
208
206
212
209
213
220 (2X)
210
204
205
234
253 (2X)
241
252 (3X)
235 (2X)
240
17
211
300
295
320
321
296
297 (2X)
288
1103-B
284 (4X)
312 (2X)
223
233
270
315
221
227
225
228
230
224 (2X)
266
226
229
231
232 (2X)
200
216 (2X)

NOTE :
ITEM 204 FOR DOLBY VERSION ONLY

MECHANICAL PARTLIST

200	4822 459 04511	FRONT CABINET /21/30
200	4822 459 04547	FRONT CABINET /22/25
201	4822 410 11027	BUTTON DISPLAY LEFT
202	4822 410 11028	BUTTON DISPLAY RIGHT
203	4822 410 11029	BUTTON DISPLAY CENTRE
204	4822 410 10198	BUTTON HSD /22/25
205	4822 410 10199	BUTTON OPTIMUM/DBB
206	4822 410 10418	BUTTON INCREDIBLE SOUND
208	4822 410 11031	BUTTON POWER/SOURCE
210	4822 410 11006	BUTTON DSC1
211	4822 410 11007	BUTTON DSC2
214	4822 410 10204	BUTTON OPEN/CLOSE
215	4822 410 10205	BUTTON CDC DELECT
216	4822 462 40683	PLATE (FOOT)
221	4822 450 10137	WINDOW DISPLAY
221	4822 450 10292	WINDOW DISPLAY /25
224	4822 492 11086	CASSETTE DOOR SPRING
225	4822 443 64597	DOOR CASSETTE LEFT
226	4822 443 64598	DOOR CASSETTE RIGHT
227	4822 492 42787	SPRING CASSETTE
228	4822 442 00797	COVER DOOR CASS LEFT
228	4822 442 00805	COVER DOOR CASS LEFT /21/30
229	4822 442 00798	COVER DOOR CASS RIGHT
230	4822 381 11672	LENS CASSETTE LEFT
231	4822 381 11673	LENS CASSETTE RIGHT
232	4822 529 10322	DAMPER ASSY
240	4822 410 10425	BUTTON EJECT LEFT
241	4822 410 10426	BUTTON EJECT RIGHT
264	4822 410 10535	BUTTON KARAOKE /21/30
265	4822 410 10533	KNOB KARAOKE /21/30
266	4822 410 10966	KNOB VOLUME ROTARY
270	4822 442 00804	COVER TRAY CDC
297	4822 462 40683	PLATE (FOOT)
298	4822 426 10069	CABINET REAR
299	4822 450 10226	WINDOW CDC
300	4822 402 10288	BRACKET MAINS SOCKET

MISCELLANEOUS

4822 445 10623	1X LOUDSPEAKER BOX
4822 303 50063	FM AERIAL
4822 218 10195	REMOTE CONTROL
4822 303 50082	AM FRAME AERIAL
4822 321 10249	MAINS CORD /21/22
4822 321 10883	MAINS CORD /37
4822 321 10886	MAINS CORD /25
4822 736 15106	INSTRUCTION DOR USE /21
4822 736 15247	INTRUCTION FOR USE /22/25
4822 146 10757	TRANSFORMER /21
4822 146 10491	TRANSFORMER /22/25/34
4822 691 10579	TAPE DECK CWB44FF06

LIST OF SCREWS

222	SCR PAN TORX TAP ST ZN BK 3X12
248	SCR PAN TORX TAP ST ZN BK 3X12
249	SCR PAN TORX TAP ST ZN BK 3X30
251	SCR PAN TORX TAP ST ZN BK 3X12
252	SCR PAN TORX TAP ST ZN BK 3X25
253	SCR PAN TORX TAP ST ZN BK 3X8
255	SCR PAN TORX TAP ST ZN BK 3X12
258	SCR PAN TORX TAP ST ZN BK 3X12
261	SCR PAN TORX TAP ST ZN BK 3X12
263	SCR PAN TORX TAP ST ZN BK 3X10
275	SCR PAN TORX TAP ST ZN BK 3X12
281	SCR WASH PAN TORX ST ZN 3X12
284	SCR WASH TORX TAP ST ZN 3X6
292	SCR WASH TORX TAP ST ZN 3X6
293	SCR WASH PAN TORX ST ZN 3X10
302	SCR PAN TORX TAP ST ZN BK 3X12
303	SCR PAN TORX TAP ST ZN BK 3X12
304	SCR WASH TORX TAP ST ZN 3X6
305	SCR PAN TORX TAP ST ZN BK 3X12
306	SCR PAN TORX TAP ST ZN M3X6
307	SCR PAN TORX TAP ST ZN BK 3X10
308	SCR WASH PAN TORX ST ZN 3X16
310	SCR WASH TORX TAP ST ZN 3X6
311	SCR PAN TORX TAP ST ZN BK 3X12
312	SCR PAN TORX TAP ST ZN BK 3X12
313	SCR WASH TORX TAP ST ZN 3X10

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PHILIPS

Art. Code: 53
Sachgebiet: AUDIO MIDI ANLAGEN

Memo: DE10WEG

SI

Wichtig für die Werkstatt!

Nummer: 53050

Datum: 26.01.98

Service Information

Betrifft: Gerätetypen siehe unten

Verteiler: S d F 1

5157
5166
5151
5136
830
5202
5165
5164
5172
5179
5152
785
5178

GERÄTETYPEN: AS670C, AS675C, AS785C, FW315C, FW340C, FW355C, FW365C, FW373C, FW375P, FW385P, FW710C, FW725C, FW730C, FW745C, FW750C, FW770P, FW780P, FW790P

ÄNDERUNG IN DER ERSATZTEILLISTE FÜR DAS CDC- 3 WECHSLER MODUL

Auf der Seite 10 - 12 im Service Manual der oben genannten Geräte ist die Service Code Nummer für die flexfoil 17p genannt.
Das 17- polige Kabel wird für dieses Modul nicht benötigt.
Das korrekte Kabel ist ein 15- poliges Kabel. Das 15- polige Kabel ist auf der Seite 10 - 14 im Service Manual unter der Pos.- Nr.: 8002 und mit der Bestellnummer 4822 320 11313 genannt.

Diese Ersatzteilkorrektur betrifft nur das ältere CDC-3 Wechsler Modul, das mit dem Platinenaufdruck 3104 113 3109x versehen ist !

Form 80 048

Nachdruck nicht gestattet! Änderungen vorbehalten.